AQUIFER EVALUATION IN THE BIG GULCH AND LITTLE GULCH AREAS OF SPRING VALLEY RANCH

October 2004

SPF Water Engineering, LLC
water resource consultants

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Prepared for

SunCor Development Company
SunCor Idaho, LLC
485 East Riverside Drive, Suite 300
Eagle, ID 83616

Prepared by

SPF Water Engineering, LLC
600 East River Park Lane
Boise, ID 83706

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SPF Water Engineering, LLC
water resource consultants

EXECUTIVE SUMMARY

SunCor Development Company is evaluating development potential for the Spring Valley Ranch property, which is located northwest of Boise, Idaho. The western portion of the Spring Valley Ranch property extends into portions of Little Gulch and Big Gulch. Surface water in both of these gulches drain southwestward into the Lower Boise River Basin. SPF Water Engineering, LLC (SPF) conducted exploration drilling, well testing, and water chemistry analyses to identify and evaluate potential water supplies for the Spring Valley Ranch project.

Two general aquifers are present in the western portion of Spring Valley Ranch. The Willow Creek aquifer is found in a sequence of thick, coarse-grained sand beds with occasional fine gravel zones. Spring Valley Ranch exploration wells SVR 6 and SVR 10 tap this aquifer. Spring Valley Ranch exploration wells penetrating the Northern Margin aquifers, characterized by interbedded sand, silt, and clay sediments, and typically underlain by a very thick clay, include SVR 7 and SVR 9 (and possibly the lower sections of SVR 10).

The Willow Creek Aquifer is also characterized by water levels substantially lower than surrounding Northern Margin aquifers. Furthermore, water chemistry and temperatures in the Willow Creek Aquifer are different than Northern Margin aquifers. Potentiometric surface contours indicate ground water flow from the Willow Creek Aquifer toward the Payette River Valley. Ground water reaching the Willow Creek Aquifer from the upper Willow Creek drainage appears to be tributary to the Payette River, not the Boise River.

These aquifers represent a substantial water resource for initial development of the Spring Valley Ranch project area. High capacity wells, with sustainable yields likely in excess of 2,000 gpm, can be constructed in the Willow Creek aquifer and in some areas of the Northern Margin aquifers.

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1. INTRODUCTION

1.1. Background

SunCor Development Company is evaluating development potential of the Spring Valley Ranch property located northwest of Boise, Idaho. The property consists of more than 30,000 acres located in Ada, Gem, and Boise Counties. The western portion of Spring Valley Ranch property extends into portions of Little Gulch and Big Gulch, both of which drain southwestward into the Lower Boise River Basin (Figure 1). Although remote from the initial project development area along State Highway 55, this area was suspected of having productive aquifers.

1.2. Purpose and Objectives

The purpose of the hydrologic analyses described in this report was to identify and evaluate potential water supplies for the Spring Valley Ranch project. The general objective was to evaluate potential water resources in the Little and Big Gulch portions of the ranch. Specific objectives of this investigation included the following:

1. Drill and construct four exploration wells in Big Gulch and Little Gulch areas.
2. Document lithology, collect and analyze water chemistry, and conduct well tests in each new exploration well.
3. Evaluate potential for ground water production in Big Gulch and Little Gulch areas on the basis of exploration well data.

This report presents data, results, and conclusions from the drilling, construction, and testing of four exploration wells in the western portion of the Spring Valley Ranch (Table 1). Potentiometric surface maps and water chemistry tables also include data from other wells in the vicinity of Big and Little Gulch.

1.3. Aquifers in the Western Portion of the Spring Valley Ranch

A number of wells in the Willow Creek Valley (Figure 2) penetrate a highly productive, coarse-grained sedimentary aquifer. The aquifer is tapped by wells located along Chaparral Road between Highway 16 and the confluence of the North and South Forks of Willow Creek. This aquifer, referred herein as the Willow Creek Aquifer, has been developed by high-capacity wells on the Lynn Ranch in the Willow Creek Valley. These wells penetrate a highly productive aquifer that is found in a sequence of thick, coarse-grained sand beds with occasional fine gravel zones. The water produced from wells in the aquifer is warm (e.g., 75°F to 85°F). Wells tapping the aquifer in Willow Creek Valley generally have static water level elevations of 2400 feet with

depths to water ranging from about 325 to 425 feet below ground surface, depending on local topography.

Date	Item
February – March 2004	Exploration Well SVR 6 (8-inch x 740 feet) constructed in Big Gulch and test pumped at 350 gpm for 24 hours with 3 feet of drawdown
March – April 2004	Exploration Well SVR 7 (8-inch x 810 feet) constructed in lower Big Gulch and test pumped at 500 gpm for 22 hours, resulting in 30 feet of drawdown.
June – August 2004	Drilling of SVR 9 (8-inch x 805 feet; Little Gulch) and SVR 10 (8-inch; upper Big Gulch); 3-hour pumping test in SVR 9 at 43 gpm with 13 feet of drawdown; 24-hour test of SVR 10 at 55 gpm and 60 feet of drawdown.

Table 1: Spring Valley Ranch Project – western area exploration drilling.

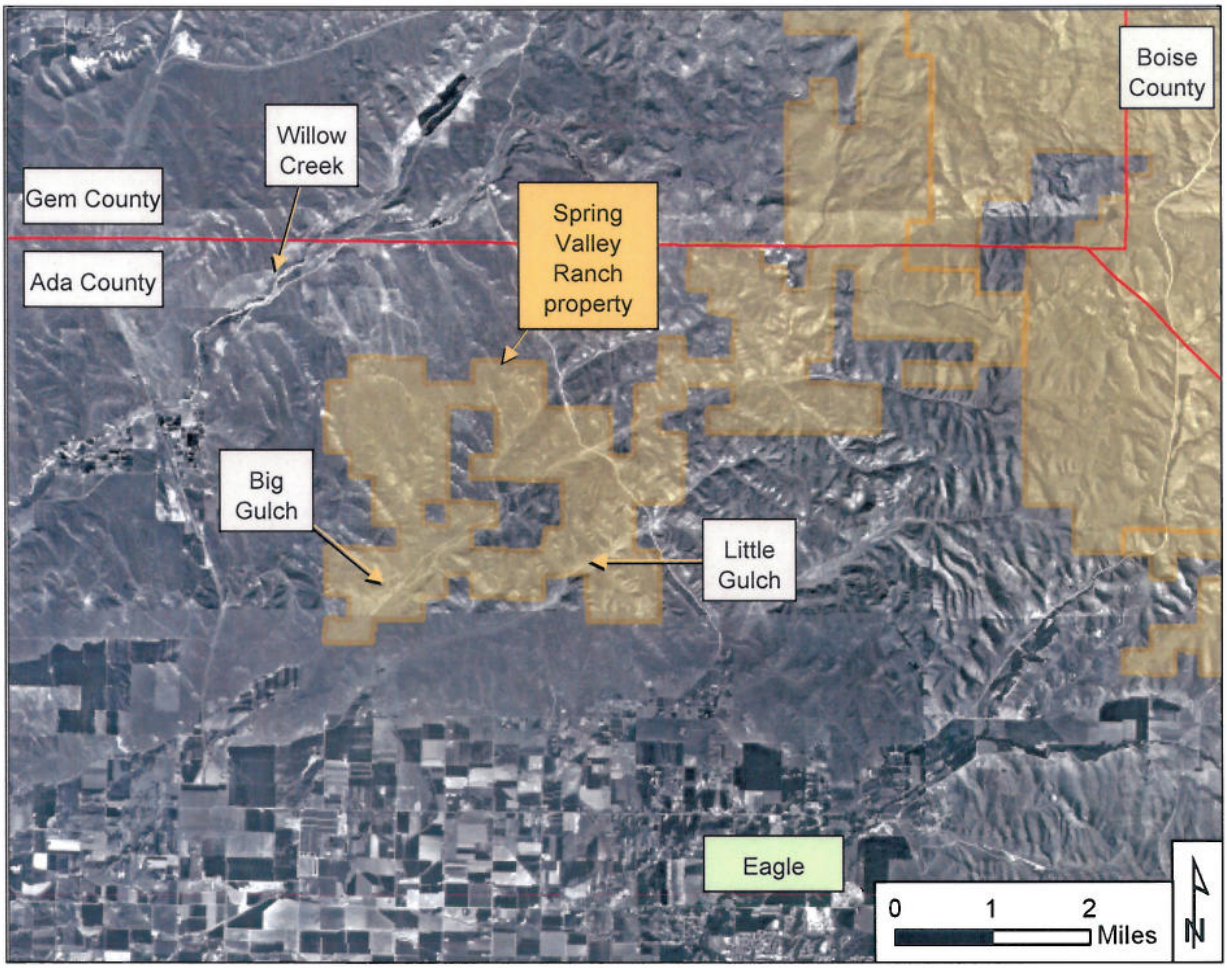

Figure 1: Western Spring Valley Ranch area.

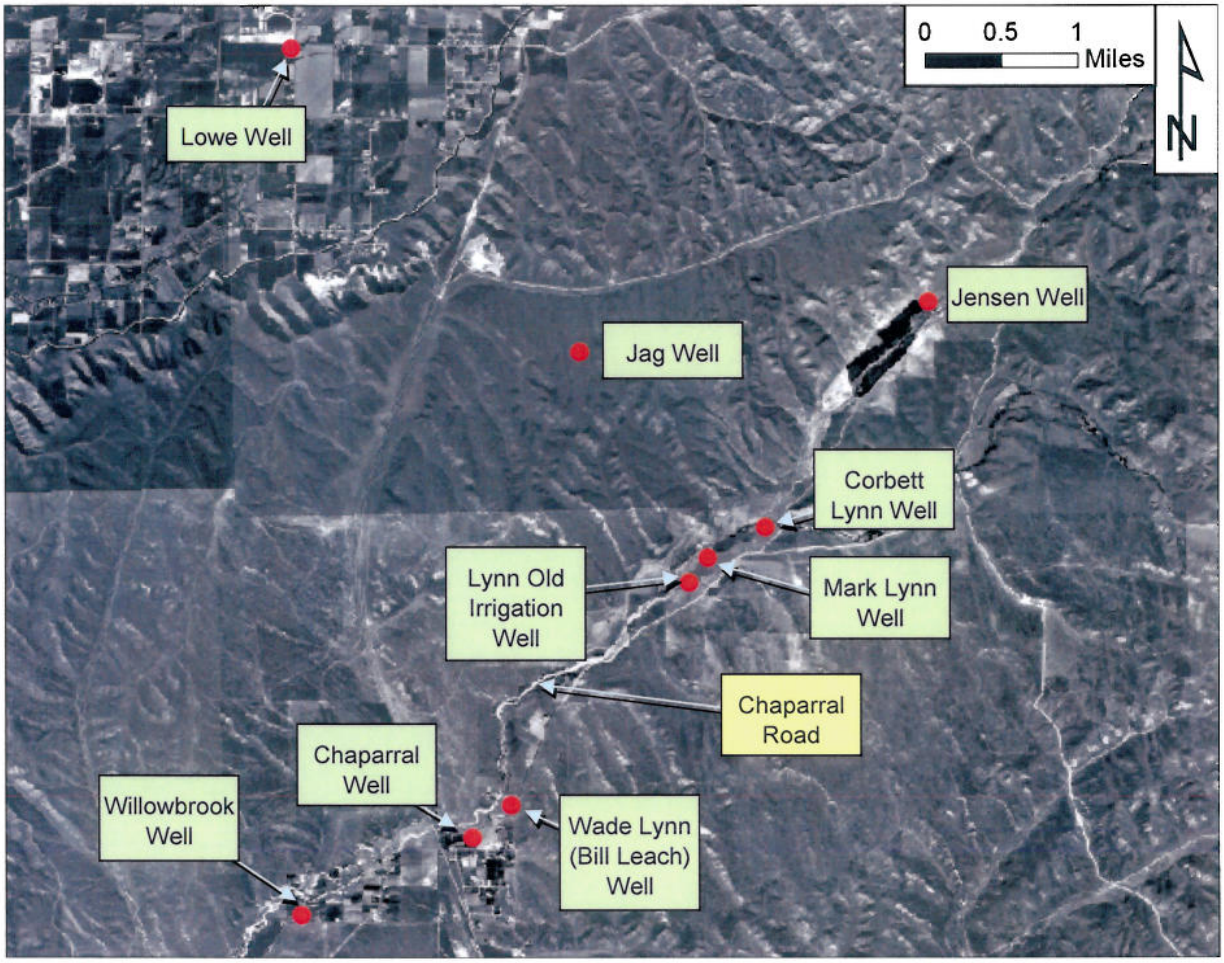

Figure 2: Willow Creek wells.

South of the Spring Valley Ranch property, numerous wells along the northern margin of the Boise Foothills (e.g., wells in the areas north of the Boise River between Eagle and Star) draw water from one or more aquifers characterized by interbedded sand, silt, and clay sediments, and typically underlain by a very thick (hundreds of feet) unit of gray (sometimes described as blue) clay. The clay is associated with the mudstone facies of the Terteling Springs Formation (Burnham and Wood, 1992). The sediments found in these aquifers, referred to herein as the "Northern Margin" aquifers (Squires et al., 1992), appear to belong to Idaho Group sediments found throughout the Boise Valley. These Northern Margin Aquifer sediments may contain productive, coarse grained layers, but are commonly interbedded with silt and clay layers. The interbedded sand, silt, and clay layers form productive cold water aquifers. Wells located in the Boise Valley in the areas north of Eagle and Star typically draw water from these Northern Margin Aquifers.

The Willow Creek Aquifer differs from the Northern Margin aquifers in several ways. The Willow Creek Aquifer contains a much thicker profile of coarse-grained sediments. Water levels in wells tapping the Willow Creek Aquifer along Chaparral Road are

approximately 150 feet lower than in wells just to the south (e.g., Chaparral and Willowbrook subdivisions). Water levels in the Willow Creek Aquifer appear to be very similar to ground water levels in the Payette River Valley near Emmett.

Ground water development potential north of the Willow Creek aquifer is poor. Published geologic maps (Savage, 1958) and reconnaissance investigation for this project (Scanlan, July 11, 2002) suggest that the area northeast of the Willow Creek Aquifer consists primarily of Miocene-age volcanic rocks (Columbia River basalt and Owyhee rhyolite), Miocene-age sedimentary rocks (Poison Creek formation and Payette formation), and Cretaceous-age granitic rocks of the Idaho Batholith. These rock units extend from the upper reaches of Big Gulch north to beyond Pearl. Significant aquifers have not been identified within these rock units.

2. WELL CONSTRUCTION

This section describes the drilling and construction of exploration wells SVR 6, SVR 7, SVR 9, and SVR 10 in the western portion of the Spring Valley Ranch. Well locations are listed in Table 2, and shown in Figure 3.

2.1. Exploration Well SVR 6

SVR 6 was the first exploration well drilled in the western portion of Spring Valley Ranch. The purpose of SVR 6 was to provide definition of local stratigraphy and explore for water-bearing zones in this area.

Well	Drainage	Location	Additional Description
SVR 6	Big Gulch	SE ¼, NW ¼, Section 13, T5N R1W	1 mile SW of Willow Creek Road
SVR 7	Big Gulch	NE ¼, SW ¼, Section 23, T5N R1W	2.5 miles SW of Willow Creek Road
SVR 9	Little Gulch	SW ¼, NE ¼, Section 19, T5N R1E	0.5 mile SW of Willow Creek Road
SVR 10	Big Gulch	SW ¼, SW ¼, Section 8, T5N R1E	0.5 mile NE of Willow Creek Road

Table 2: Big Gulch and Little Gulch exploratory well locations.

2.1.1. Construction

SVR 6 (IDWR Tag No. 0030892) was drilled by Adamson Pump and Drilling (Nampa, ID) between January 26 and February 27, 2004, using the air-rotary method. The

borehole was overbored from 0 to 105 feet. Casing (8-inch diameter, 0.250-inch wall thickness) was driven to a depth of 738 feet. A sand and cement mixture was placed from 730 to 740 feet to plug the bottom of the casing because of heaving sand. The casing was perforated with a star perforator from 560 to 720 feet. The annular space between the casing and borehole sides above 105 feet was sealed with 3,150 pounds of bentonite. The static water level was recorded at 455 feet below ground surface. The first water encountered by the driller was recorded as 560 feet, although this probably reflects the drilling method; the first water encountered is almost certainly the same as the observed static level (455 feet).

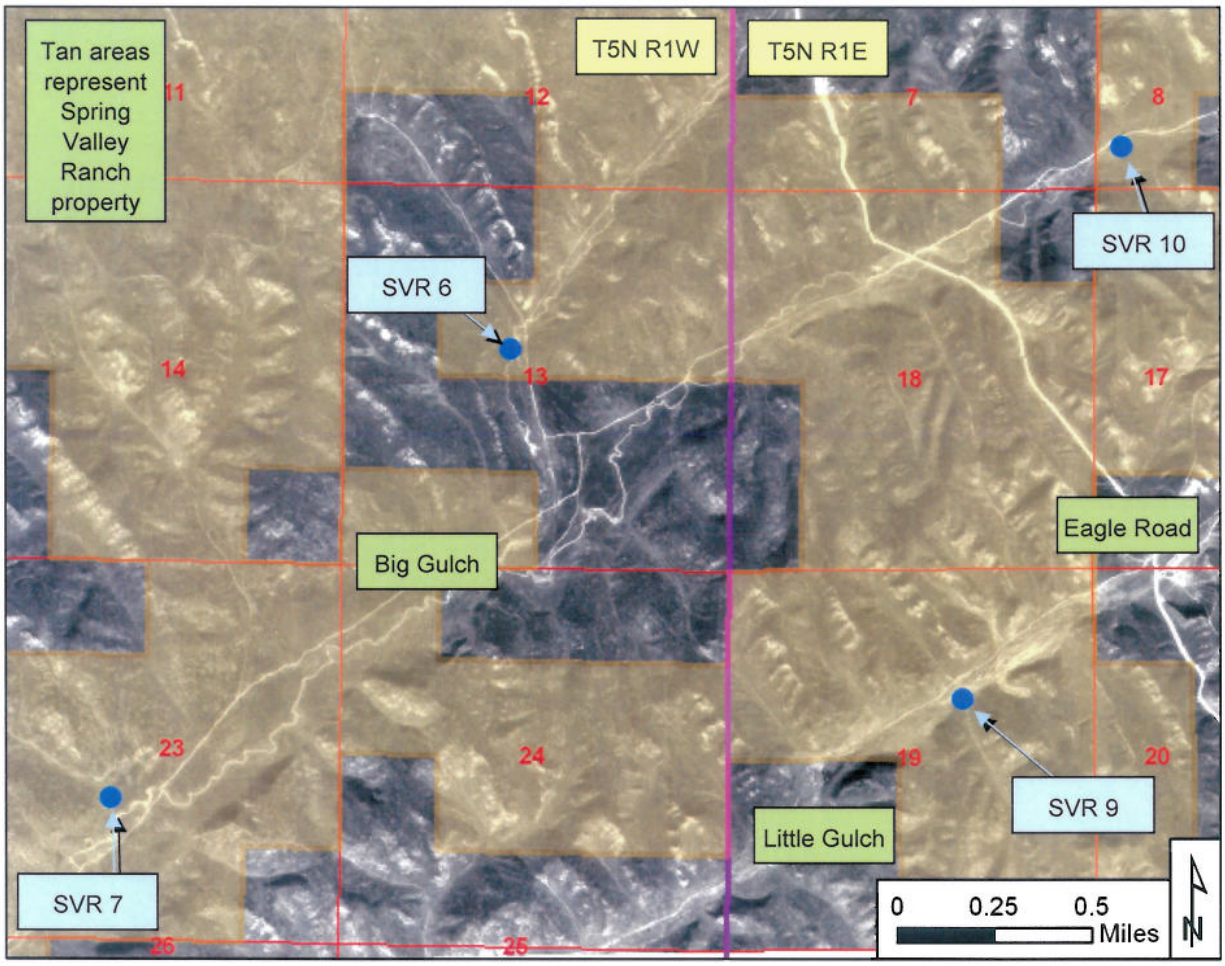

Figure 3: Locations of Exploration Wells SVR 6, 7, 9, and 10.

The lithologic materials encountered by this borehole included coarse subrounded quartz sand with fine to medium gravel; gravel (less than 1-inch diameters); and occasional iron oxide clay sediments. Sediment coloring generally varied from brown to gray with occasional iron oxide staining.

2.1.2. Well Test

A 24-hour pumping test was conducted at this well, followed by a 2-hour recovery test. During the pumping test, SVR 6 experienced a maximum water level drawdown of 2.82 feet with an average discharge rate of 358 gpm during the pumping test. Most of the drawdown can be attributed to head losses in the well bore. The aquifer recovered to within 0.16 feet of the original static level within 3 minutes after turning the pump off. The estimated transmissivity was very large: greater than 1.8×10^6 gpd/ft.

2.1.3. Water Chemistry

Water samples were collected from SVR 6 during the pumping test for water quality analyses, which included testing for public drinking water system inorganic chemical constituents. Results are summarized in Table 3; full results are provided in Appendix A. The laboratory analyses from SVR 6 generally indicated good quality water, with the exception of arsenic (0.067 mg/L).

The water temperature is of particular interest in SVR 6. The water temperature was originally measured at 81°F. Following well completion, a temperature profile of the well bore was conducted. The water temperature ranged from 87.6 degrees at 460 feet to 80.4 degrees at 727 feet. A decrease in temperature with depth is not typical of most aquifers. The decreasing temperature with depth may reflect geothermal inflow near the top of the Willow Creek Aquifer or thermal stratification within the aquifer.

2.1.4. Discussion

Results of drilling and test pumping Exploration Well SVR 6 suggest that the potential for municipal production at this site is very high. However, the arsenic level exceeded both the current and future maximum contaminant levels, and will require treatment for public water system use. Otherwise, water quality (based on inorganic constituents) appears to be acceptable for public water system use. The deep water table (455 feet) will result in a high pumping lift.

2.2. Exploration Well SVR 7

Exploration well SVR 6 clearly penetrated a highly productive aquifer. The purpose of SVR 7 was to determine whether this aquifer extended to the southwest to near the southern boundary of the Spring Valley Ranch property. SVR 7 was drilled approximately 1.6 miles to the southwest of SVR 6 in Big Gulch (Figure 3), at a location approximately 850 feet north of the Big Gulch stockwater well.

Constituent	MCL	SMCL	SVR 6	SVR 7	SVR 9	SVR 10	Lynn Old Irrig. Well	Wade Lynn Well	Corbett Lynn Well
Date			3/16/04	4/21/04	6/23/04	8/19/04	6/7/04	6/7/04	6/7/04
Arsenic	0.01*		0.067	<0.005	<0.005	0.012	.014	<0.005	0.027
Ammonia			0.13	<0.04	0.10	<0.04	<0.04	0.58	0.05
Antimony	0.006		<0.005	<0.005	<0.005	<0.005			
Barium	2		<0.05	<0.05	0.10	<0.05			
Beryllium	0.004		<0.0005	<0.0005	<0.0005	<0.0005			
Cadmium	0.005		<0.0005	<0.0005	<0.0005	<0.0005			
Calcium			9.71	29.1	24.9	17.1	17.1	17.2	20.9
Chromium	0.1		<0.002	<0.002	<0.002	0.002			
Iron		0.3	0.09	0.11	0.60	0.36	<0.05	0.08	0.05
Lead	0		<0.005						
Magnesium			0.69	8.19	10.4	3.20	0.45	2.84	0.24
Manganese		0.05	<0.05	<0.05	0.12	<0.05	<0.05	0.19	<0.05
Mercury	0.002		<0.0002	<0.0002	<0.0002	<0.0002			
Molybdenum			<0.05						
Nickel			<0.02	<0.02	<0.02	<0.02			
Potassium			1.5	2.0	2.0	2.4	1.0	2.0	1.3
Selenium	0.05		<0.005		<0.005	<0.005			
Silica			36.2				36.4	37.4	40.3
Sodium			27.8	22.9	26.9	12.3	40.9	30.3	27.8
Thallium	0.002		<0.002	<0.002	<0.002	<0.002			
Vanadium			<0.05						
Nitrate	10		1.09	0.31	<0.2	5.2	1.3	<0.2	<0.2
Nitrite	1		0.02	<0.01	<0.01	<0.01			
Phosphate			<0.05						
Alkalinity			58.8						
Bicarbonate			58.8	114	107	53.5	94.1	124	77.2
Chloride		250	5	5	10	2	6	3	4
Fluoride	4	2	0.95	0.44	0.45	0.24	4.09	0.3	1.71
Hardness			<0.05	110	102	51.8	45.6	55.4	54.4
Sulfate		250	13	24	44	<1	19	1	29
Sulfide			<0.05	<0.05		<0.05			
TDS		500	98	212	216	70	154	154	120
TSS			<3						
Conductivity (lab)					336				
Field Parameters									
Temp. (C)			27.3	20.1	20	24.4	27.9	30.5	29.8
Temp (F)			81.1	68.1	68	75.9	82.2	86.9	85.6
SC umhos/cm			182.1	300			280	254	245
EC umhos/cm			190.5			160	296	278	270
pH		6.5-8.5	7.67	7.0		7.64	7.9	7.3	7.6

Table 3: Selected water quality parameters.

2.2.1. Construction

SVR 7 (Well Tag No. 0031062) was drilled and constructed (Figure 4) between March 10 and April 10, 2004 by Adamson Pump and Drilling Company using the mud rotary method. An 8-inch diameter open borehole was drilled to a depth of 815 feet for exploration purposes. The borehole penetrated alternating layers of sand, silt, and gray-brown clay to a depth of approximately 270 feet, and a very coarse, clean, brown sand from a depth of 270 feet to 340 feet. The coarse sand was underlain by medium gray (bluish) clay with occasional fine sand and silt.

The zone from 270 to 340 feet was recognized as a potential producing zone. Well cuttings and a geophysical log for the section below 340 feet did not suggest significant production potential. Based on these determinations, a decision was made to complete a test well from 280 to 350 feet. The first step in well completion was to abandon the lower exploratory borehole by pressure grouting with bentonite from 815 feet to 380 feet. The borehole above 380 feet was then reamed to a 12-inch diameter. The well was constructed with 8-inch diameter shutter screen from 280 to 340 feet, 8-inch diameter torch perforated casing from 340 to 350 feet, and 8-inch diameter blank casing extending to above ground surface. A 5/16-inch gravel pack was installed in the annular space from 242 to 380 feet. A bentonite grout seal was pumped in place from 242 feet to ground surface.

Figure 4: Construction of SVR 7.

Following well completion, the well was developed by air-lift pumping at a rate of 100 to 200 gpm for two hours. The static water level following completion was noted at 161 feet below ground surface.

2.2.2. Well Test

A pumping test was conducted in SVR 7 for a period of 22 hours and 15 minutes. The test began as a step-rate test, with an initial discharge rate of 300 gpm for 25 minutes, followed by a rate of 400 gpm for 30 minutes, and a rate of 500 gpm for the remainder of the test period. Water levels were monitored in both the pumping well and in a stockwater well located approximately 850 feet south of SVR 7. The maximum pumping drawdown in SVR 7 was approximately 30 feet. The water level recovered to within 1.5 feet of the pre-pumping static level within minutes after turning the pump off, and to within 0.31 feet of the static level after 7.25 hours. Transmissivity was estimated to be over 300,000 gpd/day in the pumping well, and approximately 240,000 to 300,000 gpd/ft based on observation well drawdown and recovery data.

2.2.3. Chemistry

The chemistry (Table 3) of water produced from this well is excellent. Arsenic concentrations are below the detection limit, and the total dissolved solids are more than double the level found in SVR 6. Temperature was measured at 68°F. The water is richer in calcium and magnesium than the water in SVR 6, but contains less sodium.

2.2.4. Discussion

The aquifer penetrated by SVR 7 appears to be substantially different than the aquifer encountered by SVR 6 just 1.6 miles to the northeast. These differences are apparent in water levels, water chemistry, and lithology. Water levels in SVR 7 are approximately 170 feet higher than in SVR 6. Water chemistry is substantially different – SVR 7 lacks the arsenic found in SVR 6, and has higher TDS levels. The thick gray clay zone encountered in at depth in SVR 7 was not found in SVR 6.

Results of drilling and test pumping of Exploration Well SVR 7 suggest that the potential for municipal production at this site is high. Based on initial chemistry analyses, water from SVR 7 would not require treatment for arsenic.

2.3. Exploration Well SVR 9

Two different aquifers were identified with exploration wells SVR 6 and SVR 7. The purpose of SVR 9 was to determine whether either of these aquifers extended into the Little Gulch area of the Spring Valley Ranch property.

2.3.1. Construction

Exploration well SVR 9 (IDWR Tag No. D0031492) was drilled by Stevens and Sons Well Drilling using the mud-rotary method. Drilling began with an exploratory borehole that was advanced to a depth of 810 feet. Examination of a geophysical log and well cuttings suggest that no water-bearing zones are present below 265 feet. The borehole was abandoned below 265 by filling with bentonite grout. The borehole above 265 feet was then reamed to a 12" diameter, cased with 8-inch steel to 235 feet, and two 10-foot sections of stainless-steel wire-wrapped screen were placed between 235 and 245 feet and between 253 and 263 feet. A driller's report and other information for this well are included in Appendix C.

The well was developed by pumping and surging. The static water level following development was observed at 192 feet below ground surface.

The borehole penetrated a variety of fine to coarse sands, clay, clayey sands, and sandy clays to a depth of approximately 270 feet. From 270 feet to 810 feet the borehole encountered almost continuous medium gray clay, with occasional silt and fine sand. The continuous clay is probably associated with mudstone facies of the Terteling Springs Formation (Burnham and Wood, 1992). Based on lithology, the most productive horizon in this well appears to be the zone from approximately 190 feet (i.e., the static water level) to 265 feet, consisting of reddish brown to light brown, fine to coarse sands with occasional clay stringers.

2.3.2. Well Test

A 3-hour pumping test was conducted in this well on 6/23/04, followed by a 25 minute recovery test. During the pumping test, SVR 9 experienced a maximum water level drawdown of 13.9 feet at an average discharge rate of 43 gpm. Pumping water levels quickly stabilized at about 211 feet below ground surface and remained stable during the test. Within 13 minutes after the pump was stopped water levels were at pre-test levels and stable. Most of the drawdown in the well during pumping appears to be related to well loss. Transmissivity was estimated to be 4,500-20,000 gpd/ft. However, the short test duration, stable pumping water levels, and immediate recovery renders the transmissivity estimate uncertain.

2.3.3. Chemistry

Water samples were collected on June 23, 2004 from SVR 9 for water quality analyses, which included testing for public drinking water system inorganic chemical constituents. Laboratory results indicate elevated iron and manganese concentrations, but otherwise excellent water chemistry (Table 3). The water temperature during test pumping on 6/23/04 was 68°F (20°C).

The driller measured the bottom-hole temperature (at 810 feet below ground surface) by running a bit to the bottom of the borehole, then pulling up and measuring the temperature of a chunk of clay attached to the bit. He recorded a temperature of 93°F

in the clay. The actual temperature of the clay is probably higher (but cooled as the bit was retracted to ground surface).

2.3.4. Discussion

SVR 9 encountered a zone of relatively productive sands from approximately 190 to 265 feet, but the saturated thickness is less than 75 feet. Based on this exploration well, the highly productive aquifer encountered in Big Gulch does not extend into Little Gulch. The well test indicates the aquifer at SVR 9 may be capable of yielding more than 100 gpm but the aquifer is thin and static water levels are near the top of the aquifer. Consequently, long-term production potential is limited. Based on these findings, additional exploration for municipal water supplies in Little Gulch does not appear warranted.

2.4. Exploration Well SVR 10

Exploration well SVR 10 is located approximately 3.2 miles from SVR 7 and approximately 2 miles from SVR 6 in the upper portion of Big Gulch. The purpose of this well was to determine whether the highly productive aquifer encountered in SVR 6 extends into the upper portion of Big Gulch.

2.4.1. Construction

Two boreholes were drilled at the site for SVR 10. The first was drilled by Adamson Pump and Drilling Company beginning on June 7, 2004 using the air-rotary method (Figure 5). As a first step, a nominal 12-inch open hole was drilled with air-rotary to 100 feet. Casing (8-inch diameter, 0.250-inch wall thickness) was then set in the open hole, and then advanced to a depth of 620 feet using air-rotary drill and drive methods. Below 620 feet, an open borehole was advanced to 680 feet. Because of slow drilling at 680 feet the driller decided to change to a different type bit. While pulling the drill pipe and bit from the hole it became stuck at a depth of 520 feet. The driller attempted to drill through the obstruction for about 4 days then decided he would not be able to do so. Consequently he put backwards rotation on the drill pipe and unscrewed it, and was able to retrieve 260 feet of drill pipe. Apparently the casing broke or buckled at 520 feet. It may be possible to use the well for measuring water levels but for all intents and purposes the original well was lost. The driller moved forward about 25 feet and began a replacement well on June 29, 2004.

The replacement well for SVR 10 (IDWR Tag No. 0031220) was drilled using the mud rotary drilling method. A 12-inch diameter borehole was drilled to a depth of 600 feet. An 8-inch well casing was set and sealed to 600 feet, and the casing was sealed in place with bentonite grout. The well was then extended with 8-inch diameter bit to a total depth of 1,005 feet. A single-point resistivity geophysical log was conducted on the borehole below 600 feet.

Figure 5: SVR 10 well site.

Analysis of the drill cuttings and geophysical log shows that the borehole penetrated primarily coarse-grained sand with minor layers of clay and fine gravel from surface to approximately 675 feet. From 675 to 1,005 feet, the borehole penetrated primarily dark gray clay, with clayey sand between 800 and 880 feet. The section above 675 feet appears to be similar to the sediments encountered throughout the 740 feet of section penetrated by SVR 6, the sediments above 340 feet in SVR 7, and the sediments above 240 feet in SVR 9. Similarly, the sediments below 675 feet are similar to the dark gray sediments found below 340 feet in SVR 7 and below 240 feet in SVR 9.

The driller described substantially more clay in the second SVR 10 borehole than in the first borehole (which were approximately 25 feet apart). We attribute the difference in the driller's description to the appearance of cuttings produced by the mud-rotary drilling method as compared to cuttings from the air-rotary drilling method used in the first borehole.

Based on interpretation of the cuttings and geophysics, the driller was instructed to backfill the borehole to approximately 665 feet, and install 6-inch screen and casing between 580 and 665 feet. Proposed screen intervals were 655 to 665 feet and 605 to 625 feet. Unfortunately, the screen assembly became stuck during installation and the screens were installed from 580 to 600 feet (inside of the 8-inch pipe) and from 630 to 640 feet (in a zone consisting primarily of clay). The well was subsequently developed by air-lift pumping at a rate of 50 gpm. As with SVR 9, most of the

drawdown during test pumping can be attributed to well loss rather than aquifer drawdown.

2.4.2. Well Test

The well was test pumped for approximately 24 hours at a rate of 55 gpm. Water level declined approximately 60 feet during the first 8 minutes and then stabilized for the remainder of the test. Upon stopping the pump, the water level recovered to static water level within 8 minutes. Static water level was 485 feet below top of casing.

2.4.3. Chemistry

Water samples were collected during test pumping on August 19, 2004. Water chemistry analysis results (Table 3) indicated an arsenic concentration (0.012 mg/L) that exceeds the current standard (0.010 mg/L), but is not nearly as great as the arsenic concentration in SVR 6 (0.067 mg/L). The arsenic concentration is more similar to that in the Lynn Old Irrigation Well and the Corbett Lynn Well (0.014 and 0.027 mg/L, respectively). The iron concentration in SVR 10 (0.36 mg/L) exceeded the secondary standard for iron (0.3 mg/L), although the iron concentration in SVR 10 was less than in SVR 9 (0.60 mg/L). Interestingly, water from SVR 10 contained elevated nitrate (5.2 mg/L), which does not exceed the maximum contaminant level of 10 mg/L but is unusually high for ground water underlying open rangeland (background concentrations of nitrate are generally less than 0.20 mg/L).

There is increasing concern about the presence of radiological constituents in some Treasure Valley ground water. Water from SVR 10 was analyzed for uranium, radium 226, and radium 228. None of these constituents were detected in SVR 10 samples.

2.4.4. Discussion

The uppermost 675 feet of SVR 10 appears to penetrate the coarse-grained sands (with minor layers of clay and fine gravel) that typify the Willow Creek Aquifer. These were the same coarse-grained sediments encountered in the entire SVR 6 borehole, and in the upper portions of SVR 7 and SVR 9.

The lower portion of the SVR 10 borehole penetrated several hundred feet of thick, bluish-to-light gray clay associated with the lacustrine Idaho Group sediments (mudstone facies of the Terteling Springs Formation). It is therefore likely that this clay sequence underlies the entire Willow Creek Aquifer, even though the clay was not encountered in SVR 6.

The coarse-grained sediments typifying the Willow Creek Aquifer are clearly thinning toward the east. Water levels are above the aquifer-clay transition in SVR 10, but largely below the coarse-grained sediments in SVR 7 and SVR 9. The saturated section of the aquifer is approximately 150 feet thick at SVR 10.

The response to test pumping SVR 10 suggests that the well has poor hydraulic connection to a highly transmissive aquifer. Aquifer parameters could not be accurately quantified from this test. It appears that the aquifer zones penetrated by the well are productive (based on drill cuttings and the geophysical logs), which is not reflected in the test pumping. The low productivity of the test well probably reflects a problem with well completion (e.g., incorrect screen placement) rather than aquifer productivity.

The water chemistry in SVR 10 (Table 3) shows some characteristics of water in other Willow Creek Aquifer wells (e.g., SVR 6 and the three Lynn wells on Chaparral Road). Water in SVR 10 contained elevated arsenic concentrations, relatively low TDS levels, and greater bicarbonate concentrations than the two test wells that appear to be completed in the Northern Margin aquifers (SVR 7 and SVR 9). Water in SVR 10 also has a warm temperature (76 °F), although not quite as warm as the SVR 6 and the other Willow Creek Aquifer wells. However, the iron concentration in SVR 10 is similar to SVR 7 and SVR 9. Water chemistry in SVR 10 probably reflects mixing between waters in the Willow Creek Aquifer and Northern Margin aquifers. Alternatively, the water in SVR 10 may be a mixture of surface recharge from the Big Gulch watershed and upwelling of older geothermal water.

3. HYDROGEOLOGICAL CHARACTERIZATION

3.1. Introduction

Four exploratory wells (SVR 6, SVR 7, SVR 9, and SVR 10) were drilled in the Big and Little Gulch area of Spring Valley Ranch ("Western Ranch Area") as part of this project. General lithologic descriptions, well testing results, and water chemistry results were presented in Section 2.

This section presents a discussion of aquifer characteristics in the Western Ranch Area. The discussion is based on exploratory drilling results, water level data, geological cross-sections, and water chemistry. The purpose of the discussion is to evaluate the extent of water supply and possible sustainable yield from this area.

3.2. Western Spring Valley Ranch Wells

Based on similarities in geology, temperature, chemistry, and water levels, it appears that wells SVR 6 and SVR 10 in the Big Gulch area encountered the Willow Creek Aquifer (see Section 1.3 for a general description of the Willow Creek Aquifer). SVR 6 penetrated a very thick, coarse grained, subangular quartz sediment aquifer with a deep static water level (455 feet at SVR 6), very high transmissivity, and warm temperatures (81°F). The high transmissivity is apparent from both the pumping test

response at SVR 6 (T>1,000,000 gpd/ft) and a nearly flat water table (see Section 2.1.2). Saturated aquifer thickness at SVR 6 is more than 285 feet.

Wells SVR 7 and SVR 9 penetrate sediments that are similar to (and probably the same as) the Northern Margin aquifers found in the northern portion of the Boise River Valley. The wells penetrated interbedded sand, silt, and clay zones, underlain by the massive clay sequence associated with the mudstone facies of the Terteling Springs Formation (Burnham and Wood, 1992). The water-bearing section of the aquifer appears to be 200 to 300 feet thick at SVR 7 in lower Big Gulch. The water-bearing section was less than 100 feet thick at SVR 9 in Little Gulch, suggesting that the aquifer "pinches out" to the northeast, and has little development potential in that area. More than 500 feet of low permeability clay or mudstone underlie the water-bearing section in SVR 9.

SVR 10 penetrates coarse-grained Willow Creek Aquifer sediments seen in SVR 6, but also extends into the thick clay sequence associated with Idaho Group lacustrine deposits (Terteling Springs mudstone facies) found in SVR 7 and SVR 9. Thick, coarse-grained sediments clearly diminish to the east, suggesting that SVR 10 is near the eastern margin of the Willow Creek Aquifer.

3.3. Water Chemistry

Water chemistry in the western portion of Spring Valley Ranch was evaluated using project data and data available from previous water quality sampling by the IDWR, USGS, and other agencies. Project data included water chemistry analyses from SVR 6, SVR 7, SVR 9, SVR 10, the ranch's two stockwater wells in Big Gulch and Little Gulch (see Scanlan Engineering, April, 2003), and the Corbett Lynn Well, Lynn Old Irrigation Well , and Wade Lynn Well in the Willow Creek drainage (see Figure 6).

A number of differences were apparent between water drawn from the hypothesized Willow Creek Aquifer and the Northern Margin aquifers. First, ground water from the Willow Creek Aquifer had water temperatures greater than 81.1°F (the highest temperature of 86.9°F was measured in the Wade Lynn Well). In contrast, water temperatures in the Northern Margin Aquifers are lower (e.g., SVR 7 and SVR 9 had water temperatures of 68°F). SVR 10 had a water temperature (75.9°F), which is between the elevated temperatures of the Willow Creek Aquifer wells (e.g., SVR 6) and the Northern Margin wells (e.g., SVR 7 and SVR 9).

Second, anion and cation compositions (Figure 7,) were similar for all of the wells thought to draw water from Northern Margin aquifers (SVR 6, SVR 7, SVR 9, and the Big Gulch and Little Gulch stockwater wells), although SVR 9 had a greater chloride concentration than the others in this group. Waters from wells thought to penetrate the Willow Creek Aquifer had different anion and cation compositions than those from the Northern Margin aquifers. Interestingly, anion and cation compositions were also different among waters from the Willow Creek Aquifer, suggesting that mixing occurs as water flows into the Willow Creek Aquifer.

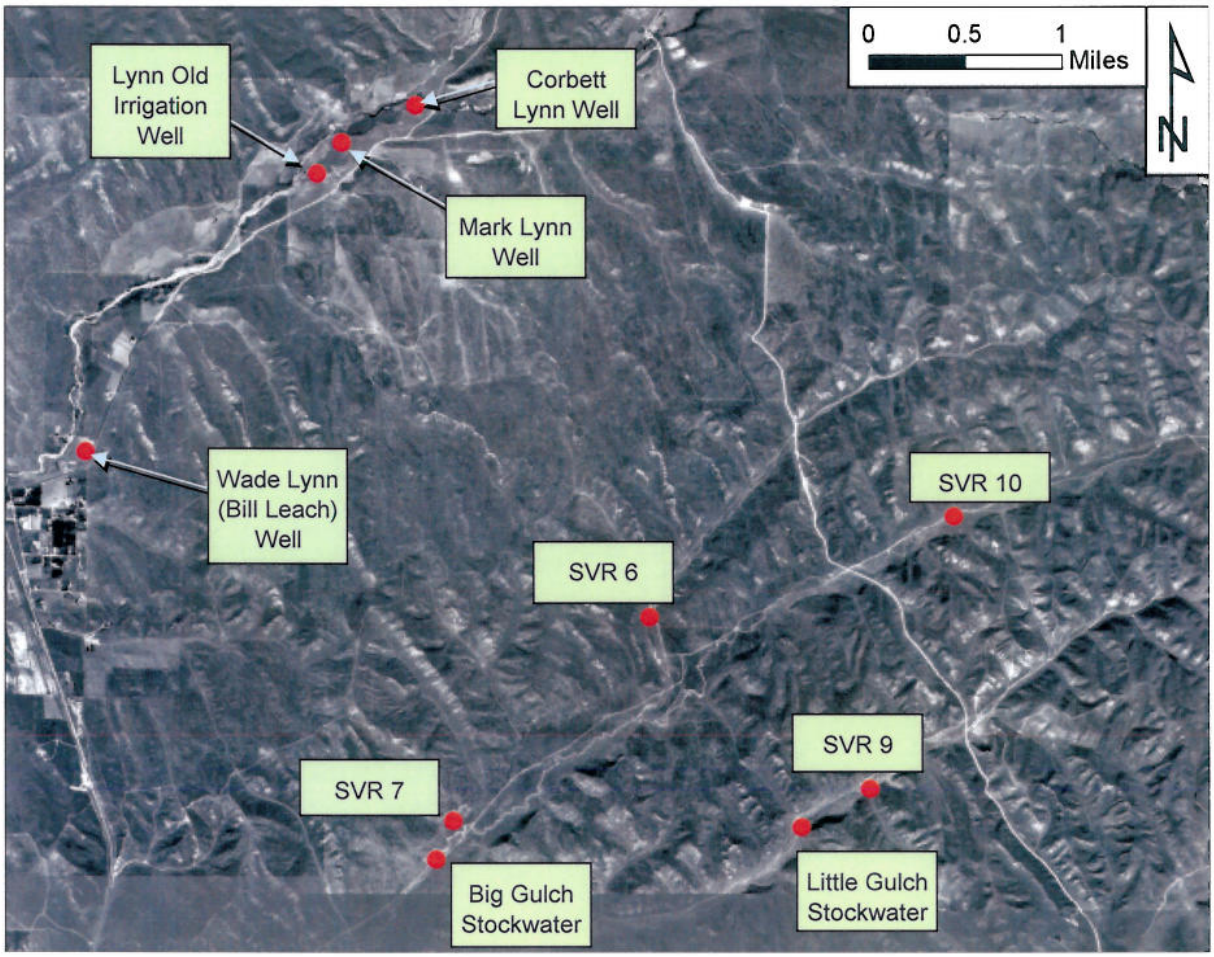

Figure 6: Well locations for water chemistry data.

TDS concentrations in all of the wells associated with Northern Margin aquifers were over 200 mg/L (with the exception of the Little Gulch Stockwater well, which had a TDS concentration of 192 mg/L). In contrast, water from wells in the Willow Creek Aquifer had TDS concentrations less than 154 mg/L (SVR 6 and SVR 10 contained 98 and 70 mg/L, respectively).

SVR 6, SVR 10, the Lynn Old Irrigation Well, and the Corbett Lynn Well showed elevated arsenic levels (water from all 4 wells exceeded the current arsenic MCL of 0.010 mg/L, which will be enforced beginning in 2006). In comparison, the arsenic concentrations in SVR 7 and SVR 9 were below the detection limit of 0.005 mg/L. The Big and Little Gulch Stockwater wells had arsenic concentrations of 0.005 and 0.006 mg/L, respectively.

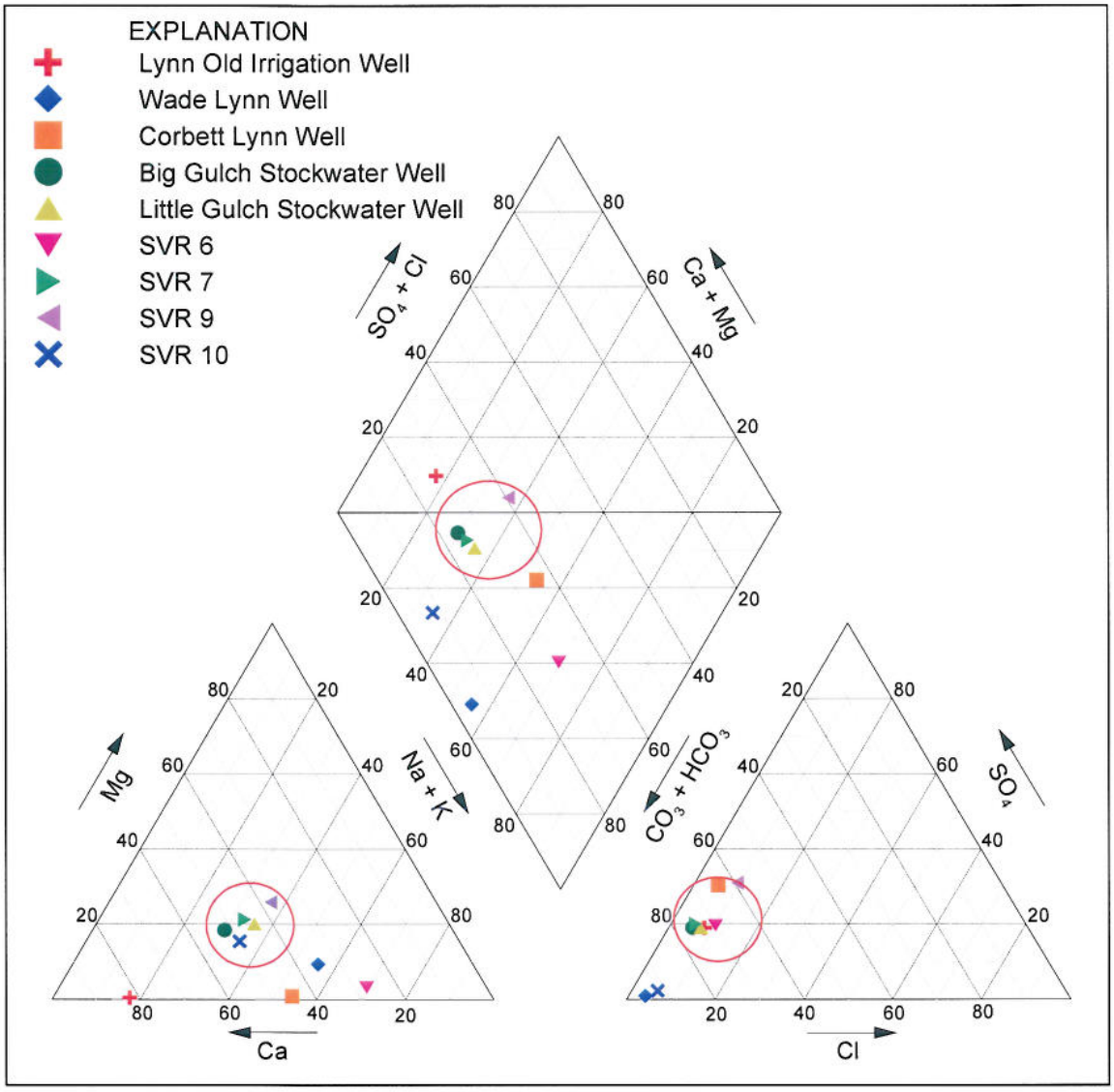

Figure 7: Anion and cation data from wells in the western portion of Spring Valley Ranch, with Northern Margin Aquifer wells circled.

Regional arsenic values, based on water chemistry results from Spring Valley Ranch wells and IDWR data, are shown in Figure 8. A number of wells north of Eagle and Star at the base of the Boise Foothills contain arsenic concentrations ranging from 0.010 to 0.050 mg/L – the highest observed value was 0.027 mg/L. Similarly, Spring Valley Ranch wells in the Sandy Hill area and the associated spring that supplies the ranch headquarters all contain arsenic concentrations exceeding 0.010 mg/L.

The water chemistry in the Wade Lynn well seemed somewhat anomalous. The water level and temperature were consistent with the Willow Creek Aquifer, but the well had low arsenic levels (below detection limit). Several other water chemistry constituents in the Wade Lynn wells also indicate water chemistry similarities with the Northern

Margin Aquifers (e.g., magnesium bicarbonate). These similarities in the Wade Lynn Well may reflect dilution from subsurface inflows from the south.

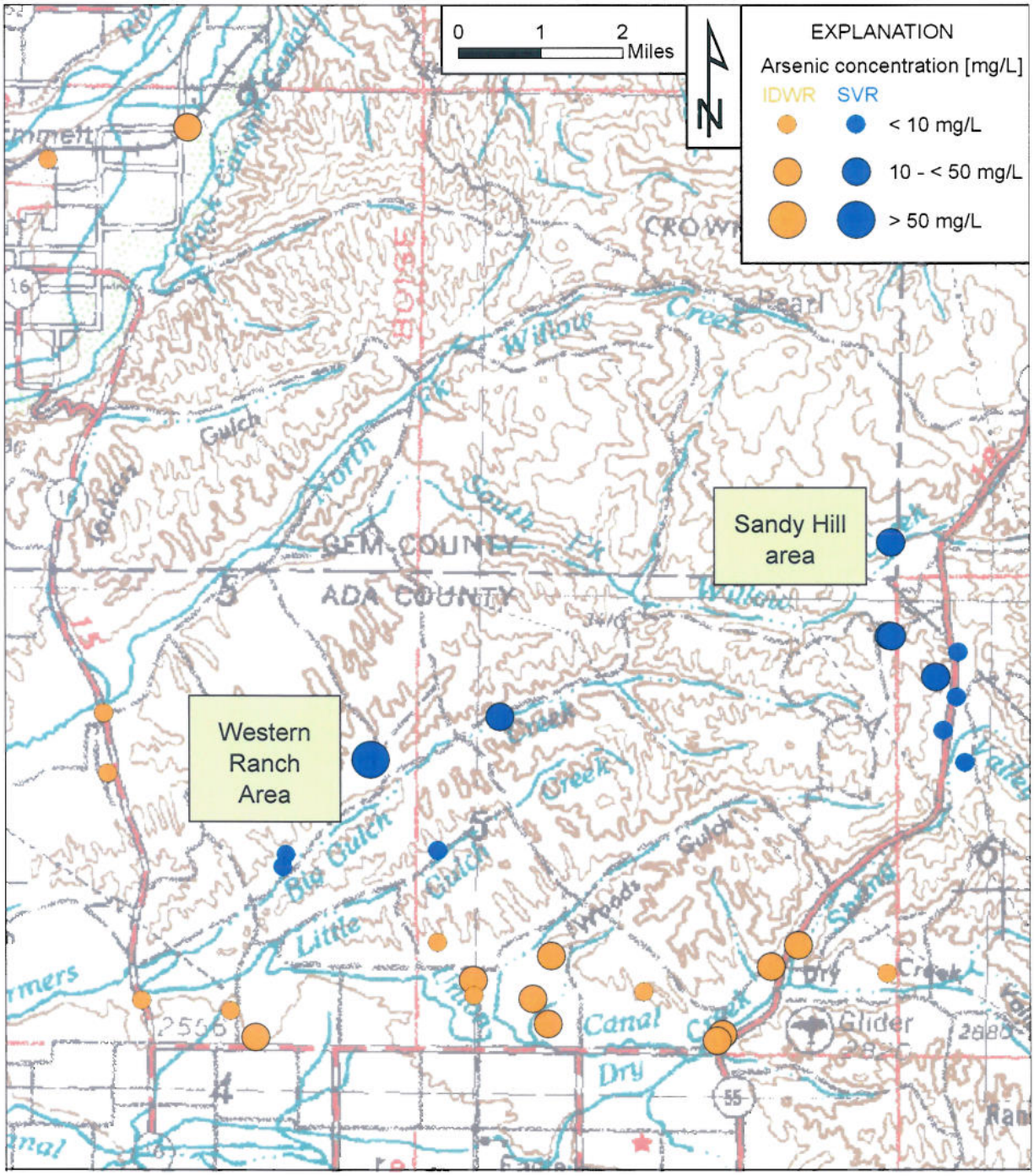

Figure 8: Arsenic levels in the area north of Eagle, Idaho.

Fluoride is a constituent frequently associated with geothermal water. Water temperatures in the Willow Creek Aquifer (e.g., SVR 6) were found to be higher than in the Northern Margin Aquifer. The fluoride concentration in SVR 6 (0.95 mg/L) was twice that found in SVR 7 (0.44 mg/L). Fluoride concentrations in the Lynn Old Irrigation Well and the Corbett Lynn Well were 4.09 and 1.71 mg/L, respectively. This, along with elevated water temperatures, suggests that there probably is geothermal inflow into the Willow Creek Aquifer. Interestingly, despite a somewhat elevated temperature, the fluoride concentration in SVR 10 (0.24 mg/L) was lower than SVR 7 and SVR 9 (0.44 and 0.45 mg/L, respectively).

In summary, water chemistry in wells associated with the Willow Creek Aquifer appear to be different from water in wells associated with Northern Margin Aquifers. The differences include different water temperatures, higher arsenic concentrations, and generally lower TDS levels.

From a water production perspective, water quality in SVR 6 (reflecting the Willow Creek Aquifer) is generally good, with relatively low total dissolved solids, low iron, and low manganese. However, the arsenic concentrations exceed both current and future arsenic standards, and will require treatment prior to municipal use. Water quality in SVR 7, Big Gulch Stock Well, and Little Gulch Stock Well (Northern Margin aquifers) is excellent, although TDS values are higher (but still well within municipal standards) than those found in the Willow Creek wells. Arsenic, if present in water samples from these wells, is below the U.S. Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL). Water in SVR 10 has characteristics of both the Willow Creek Aquifer (elevated temperature and arsenic, low TDS) and Northern Margin aquifers (low fluoride and elevated iron).

Temperature also may be an issue of concern for development of the Willow Creek Aquifer. Temperatures appear to range from approximately 75°F to 90°F. Groundwater with a temperature of more than 85 degrees F is classified as low-temperature geothermal. There are regulatory restrictions on the use of such water for non-heating uses. Exemptions from rules restricting the use of low-temperature geothermal water can be obtained in instances where there is no other practical water source. Temperature is not an issue of concern for wells in the Northern Margin aquifer. Water temperature from SVR 7 was 68 degrees, which is very suitable for municipal use.

3.4. Regional Water Levels

A potentiometric surface map that includes the Western Ranch Area was developed using water level data obtained from exploration wells and existing wells (Figure 9). In general, hydraulic gradients indicate ground water flow from northeast to southwest, reflecting local topography. However, a local depression is apparent in the middle section of Big Gulch and a portion of Willow Creek – the area identified as the Willow Creek Aquifer. Wells with available water level data completed in this aquifer (SVR 6, three Willow Creek wells, and the Jag well; see Figure 9) all indicate a water elevation

consistent with the Payette River Valley near Emmett. Potentiometric surface contours indicate ground water flow in the Willow Creek Aquifer toward the Payette River. Water level data from Little Gulch wells indicate ground water flow from the Boise Foothills into the Lower Boise River Valley.

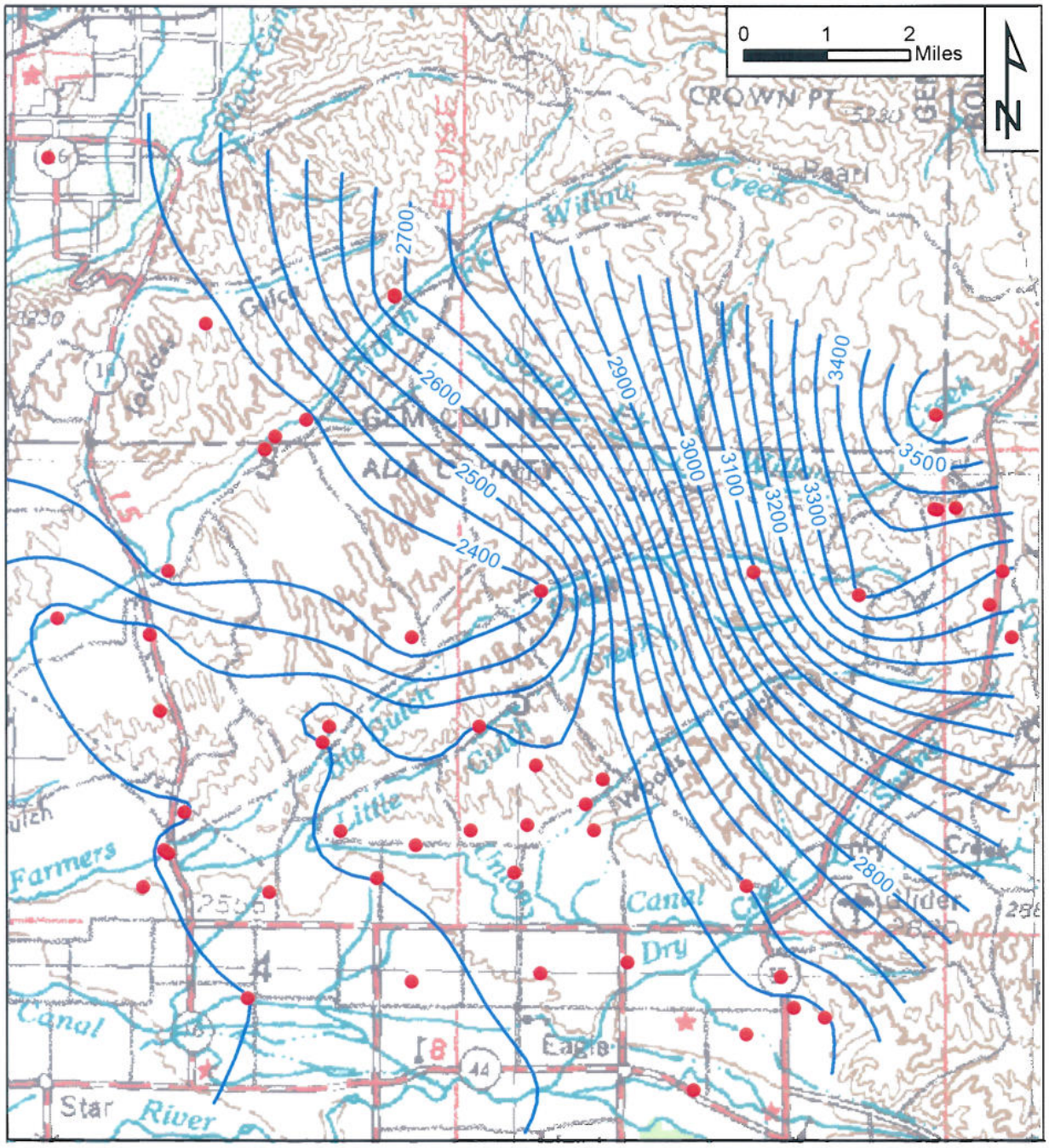

Figure 9: Water levels in the are north of Eagle, Idaho.

3.5. Areal Extent

Several cross sections were drawn to help evaluate areal extent of the Willow Creek and Northern Margin Aquifers in the western portions of Spring Valley Ranch (Figure 10, Appendix E). Based on available lithologic and water level (Figure 8) information, the Willow Creek Aquifer appears to extend from the middle portion of Big Gulch toward the Payette River Valley near Emmett. The Willow Creek Aquifer sediments were not apparent in wells SVR 7 (lower Big Gulch) or SVR 9 (Little Gulch), although it is possible that the sands in the upper portions of these wells reflect a transition between the predominantly coarse-grained sands of the Willow Creek aquifer and the medium- and fine-grained sands typical of the Northern margin aquifers. The Willow Creek sediments were also not present in the Jag well, which is located between the Payette Valley and the Willow Creek Aquifer area. However, the water level in the Jag Well indicates that the Jag Well area is hydraulically connected to the Willow Creek Aquifer.

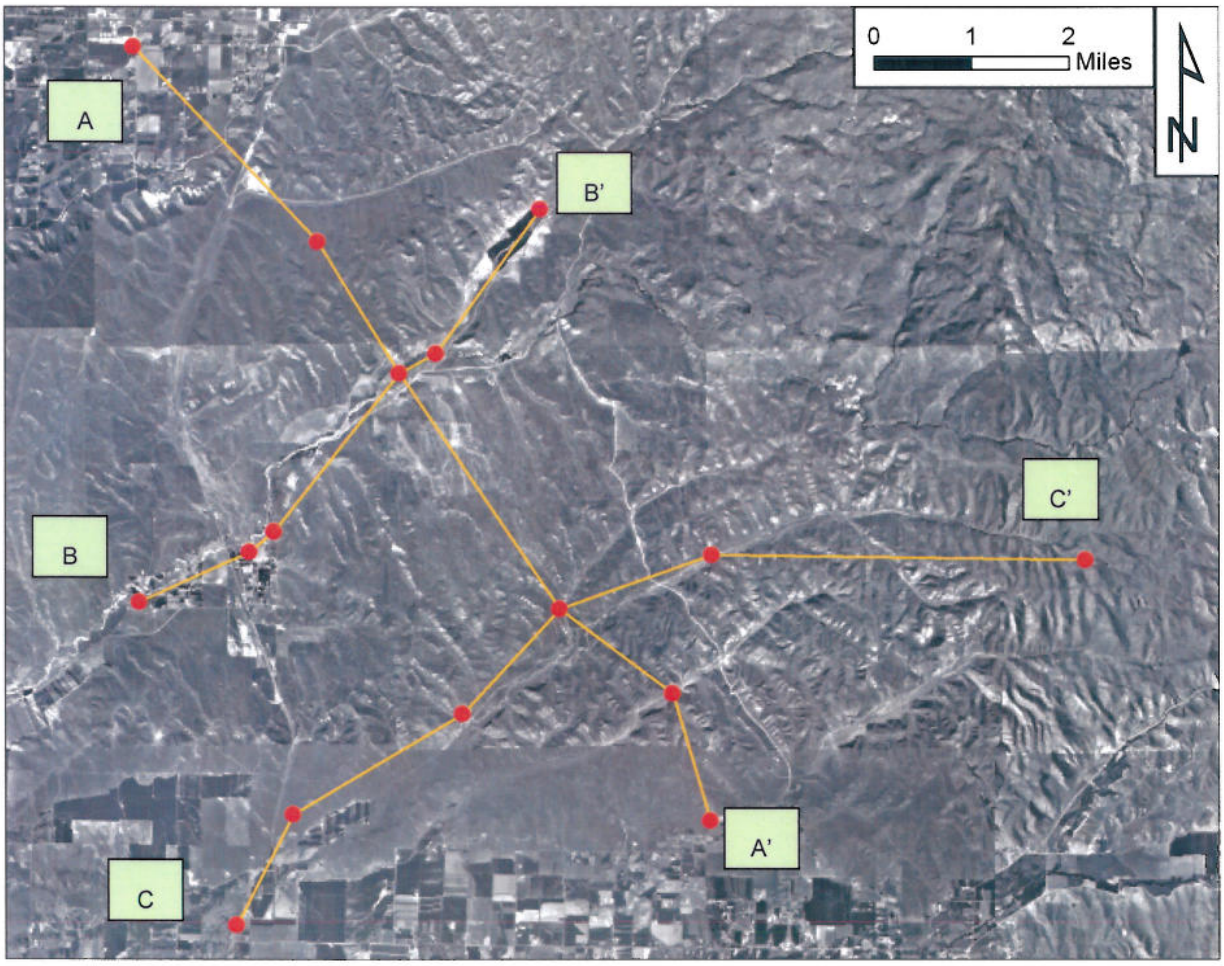

Figure 10: Cross section locations.

Hydraulic gradients north of the Willow Creek Aquifer are steep, generally suggesting both low permeability rock types and high topographic relief. The northern extent of the Willow Creek Aquifer can be defined by the change from high gradient to low gradient in Figure 9.

The Northern Margin aquifers are areally extensive to the south, southeast, and southwest from the Willow Creek Aquifer. Similar lithology is observed in wells between the Boise Foothills and the Boise Valley, from West Boise to beyond Star.

3.6. Hydraulic Discontinuity

Water levels in the Willow Creek Aquifer are substantially lower than water levels in the Northern Margin aquifers, as typified by water levels in SVR 6 and SVR 7. For example, water levels in SVR 6 are approximately 170 feet lower than in SVR 7, which is located about 1.5 miles southwest of SVR 6. These differences, combined with lithologic differences, suggest a hydrogeologic discontinuity between the Northern Margin aquifer in lower Big Gulch and the Willow Creek Aquifer. The nature of the discontinuity is unclear at this time. Given the sediments encountered in the Big and Little Gulch wells, faulting seems most likely. The discontinuity juxtaposes the coarse-grained alluvial sands and gravels of the Willow Creek Aquifer against the layered lake-bed and deltaic sediments of the Northern Margin aquifer. A similar discontinuity likely forms the northeast boundary of the Willow Creek Aquifer. The apparent boundary follows the northwest trend of the fault system that defines the northern edge of the Snake River Plain.

4. CONCLUSIONS

The following conclusions can be drawn as a result of this investigation:

1. The western portion of the Spring Valley Ranch overlies a geologically-complex, hydrologically unexplored area. At least two aquifers are present in the western portion of the Spring Valley Ranch - the Willow Creek Aquifer and one or more aquifers associated with Northern Margin Aquifers found in other areas north of Eagle.
2. The aquifers represent a significant water resource.
3. The Willow Creek Aquifer is identified by water levels substantially lower than surrounding Northern Margin aquifers.
4. Water chemistry and temperature characteristics in the Willow Creek Aquifer are different than Northern Margin aquifers.
5. Potentiometric surface contours indicate ground water flow from the Willow Creek Aquifer toward the Payette River Valley.

6. Ground water reaching the Willow Creek Aquifer from the upper Willow Creek drainage appears to be tributary to the Payette River, not the Boise River.
7. High capacity wells can be constructed in both the Willow Creek and Northern Margin aquifers.

5. REFERENCES

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Scanlan, T.M., July 11, 2002. Phase I Groundwater Exploration Program - Spring Valley Ranch Project, Letter report from Scanlan Engineering to SunCor Development Company.

Squires, E., Wood, S.H. and Osiensky, J.L., 1992. Hydrogeologic Framework of the Boise Aquifer System, Ada County, Idaho, Research Technical Completion Report, Idaho Water Resources Research Institute, University of Idaho. 114 pp.

Urban, S.M., 2004. Water Budget for the Treasure Valley Aquifer System for the Years 1996 and 2000, Idaho Department of Water Resources.

Urban, S.M. and Petrich, C.R., 1998. 1996 Water Budget for the Treasure Valley Aquifer System, Idaho Department of Water Resources Research Report.

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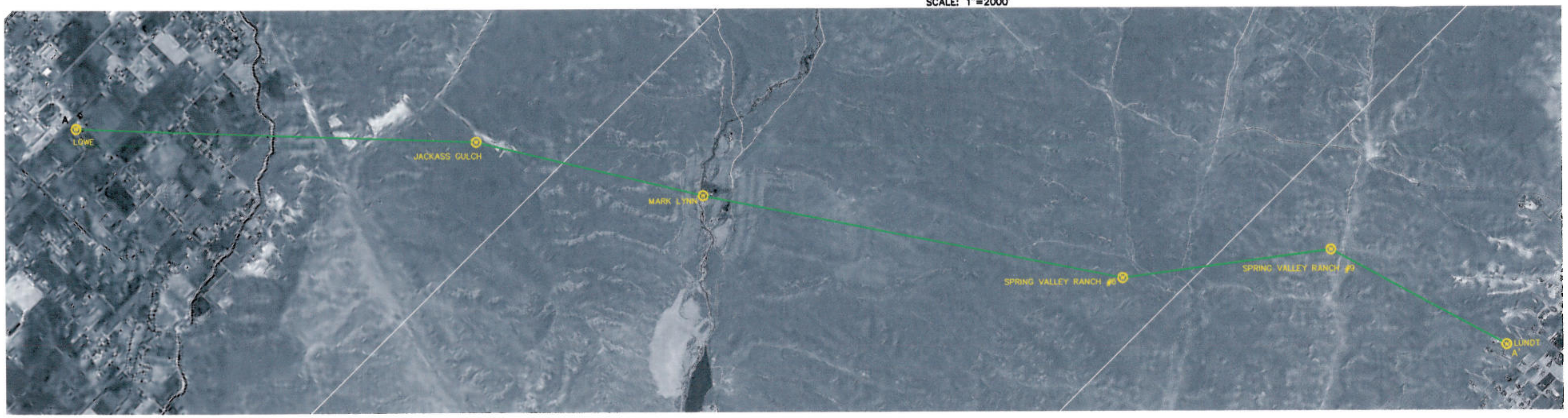
Pages: 29



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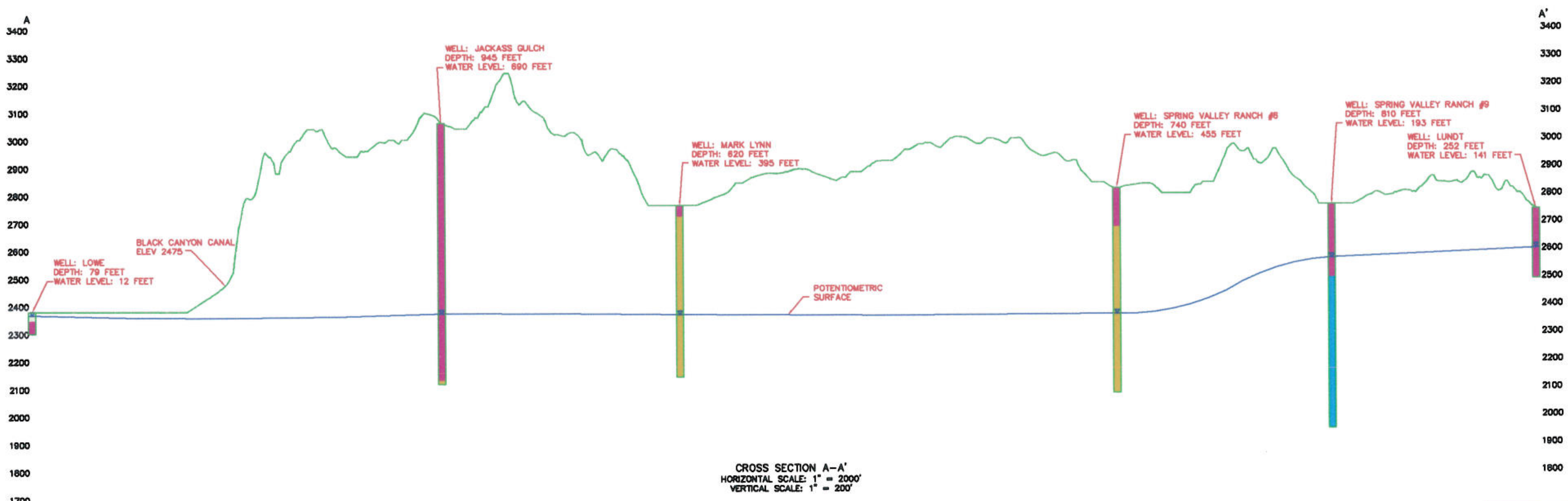
- COARSE SAND AND SANDSTONE
- BASALT
- GRANITE
- CLAY OR MUDSTONE (BLUE AND GRAY)



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VERTICAL SCALE: 1" = 200'

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SPF Water Engineering, LLC
water resource consultants
600 East River Park Lane, Suite 105, Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

GEOLOGIC CROSS SECTIONS WESTERN WELL FIELD AREA
SPRING VALLEY RANCH
CROSS SECTION A-A'

TERRY SCANLAN
SPF WATER ENGINEERING, LLC
600 EAST RIVER PARK LANE, SUITE 105
BOISE, IDAHO 83706
PHONE: 208-383-4140

OWNER/DEVELOPER
SUNCOR DEVELOPMENT CO.
SUNCOR IDAHO, LLC
485 E. RIVERSIDE DR. SUITE 300
EAGLE, IDAHO 83616

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CHECKED BY:	T. SCANLAN
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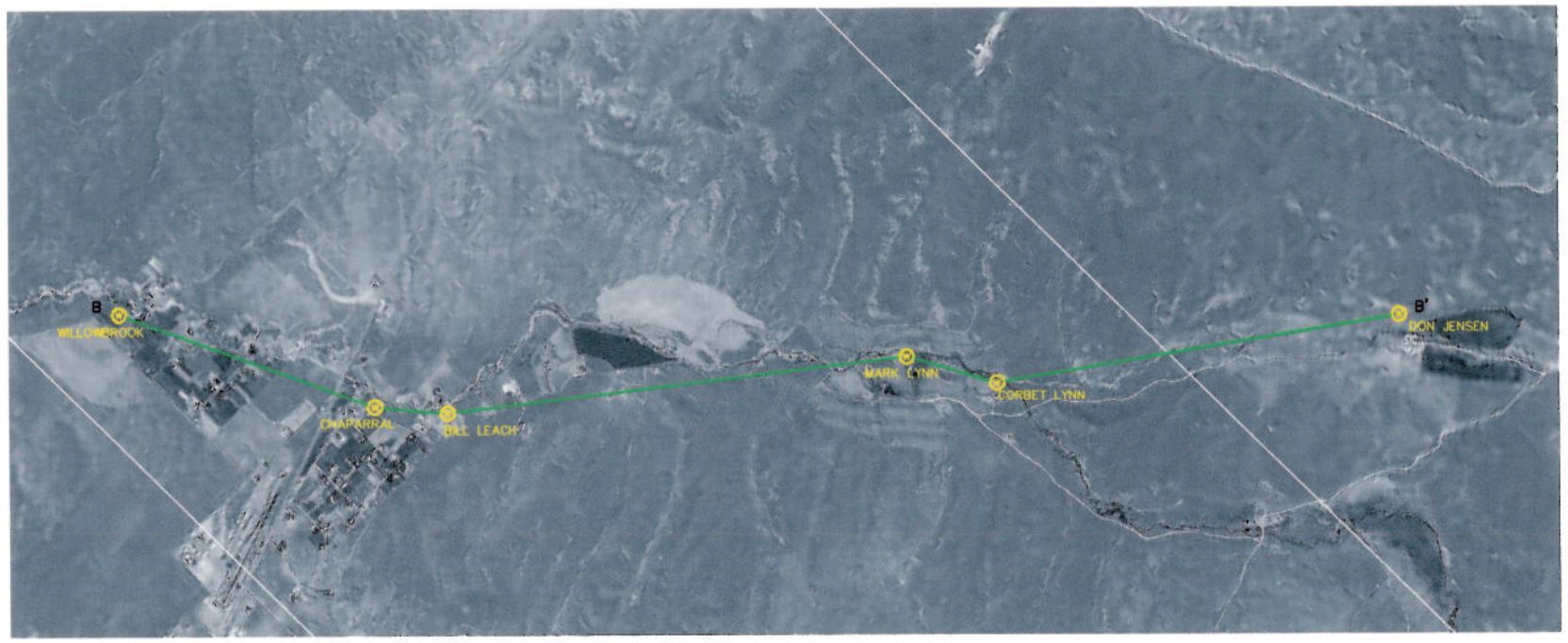

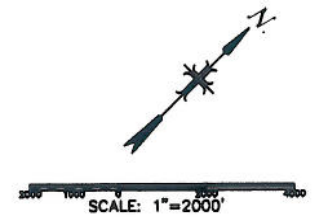

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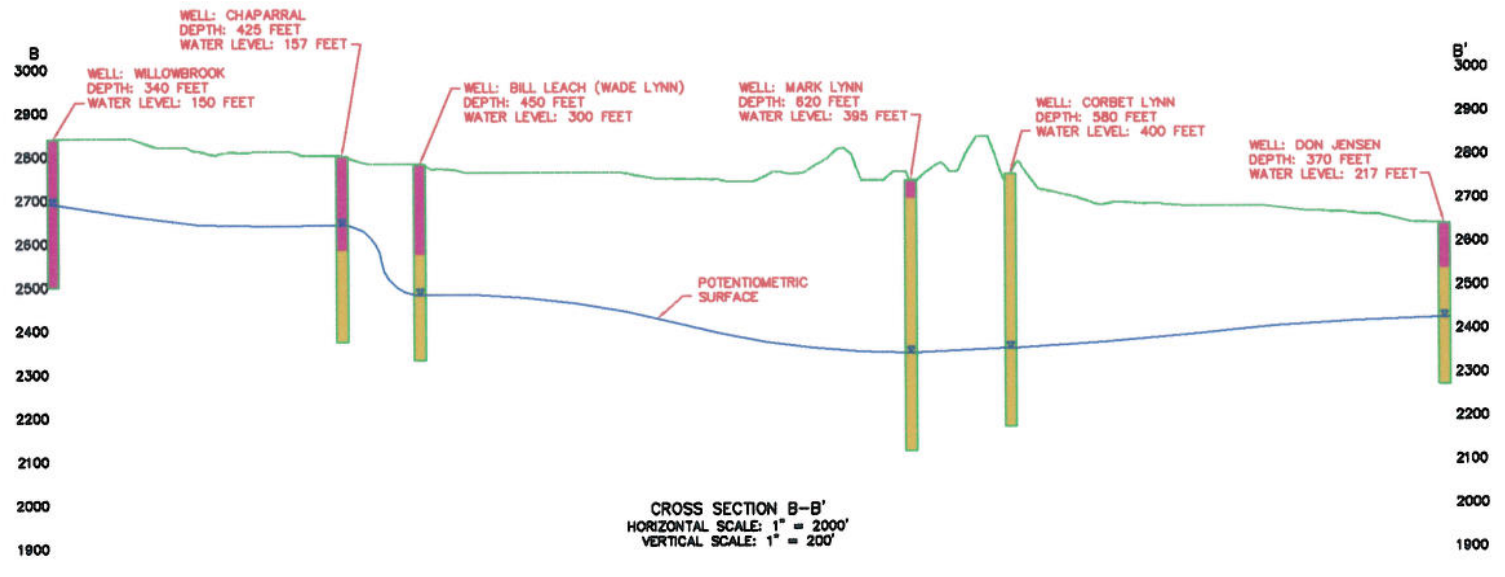

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SPRING VALLEY RANCH
CROSS SECTION B-B'

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SPF WATER ENGINEERING, LLC
600 EAST RIVER PARK LANE, SUITE 105
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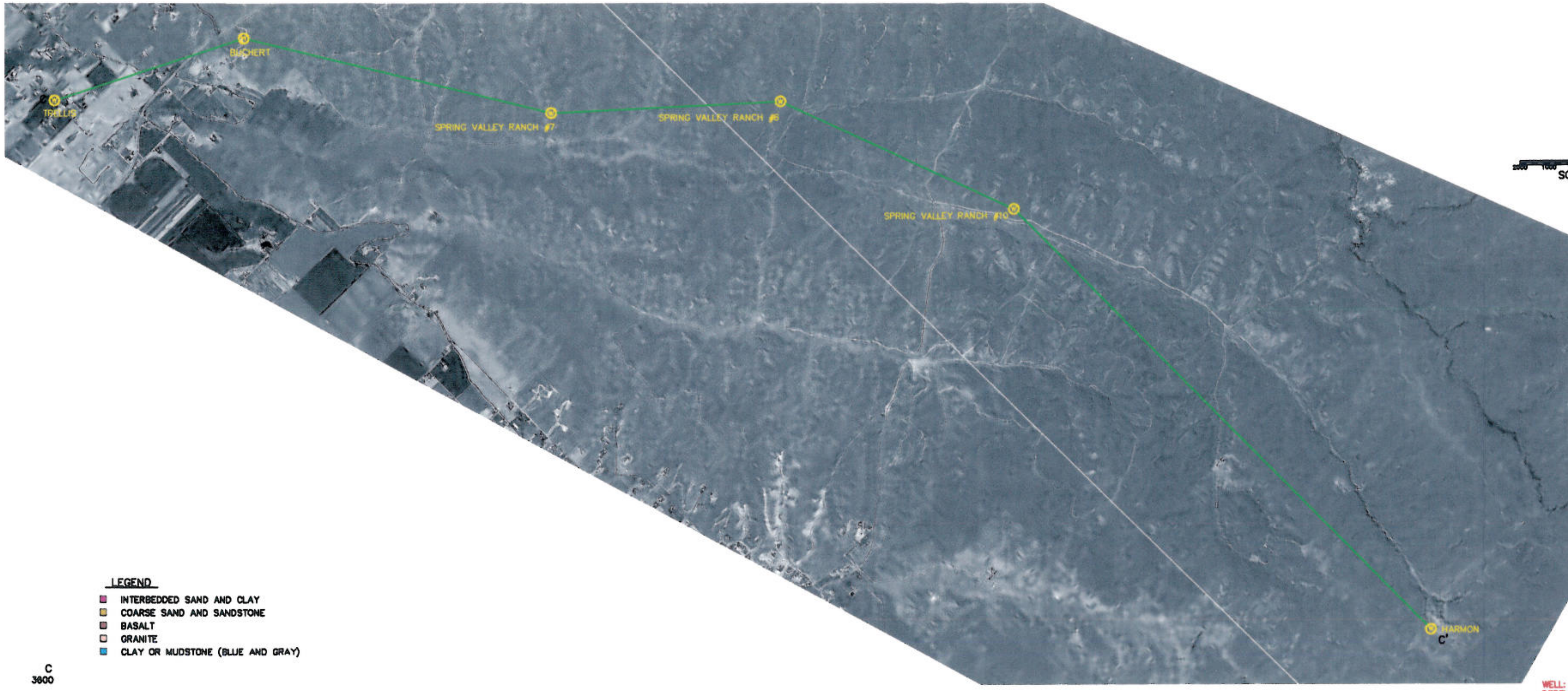

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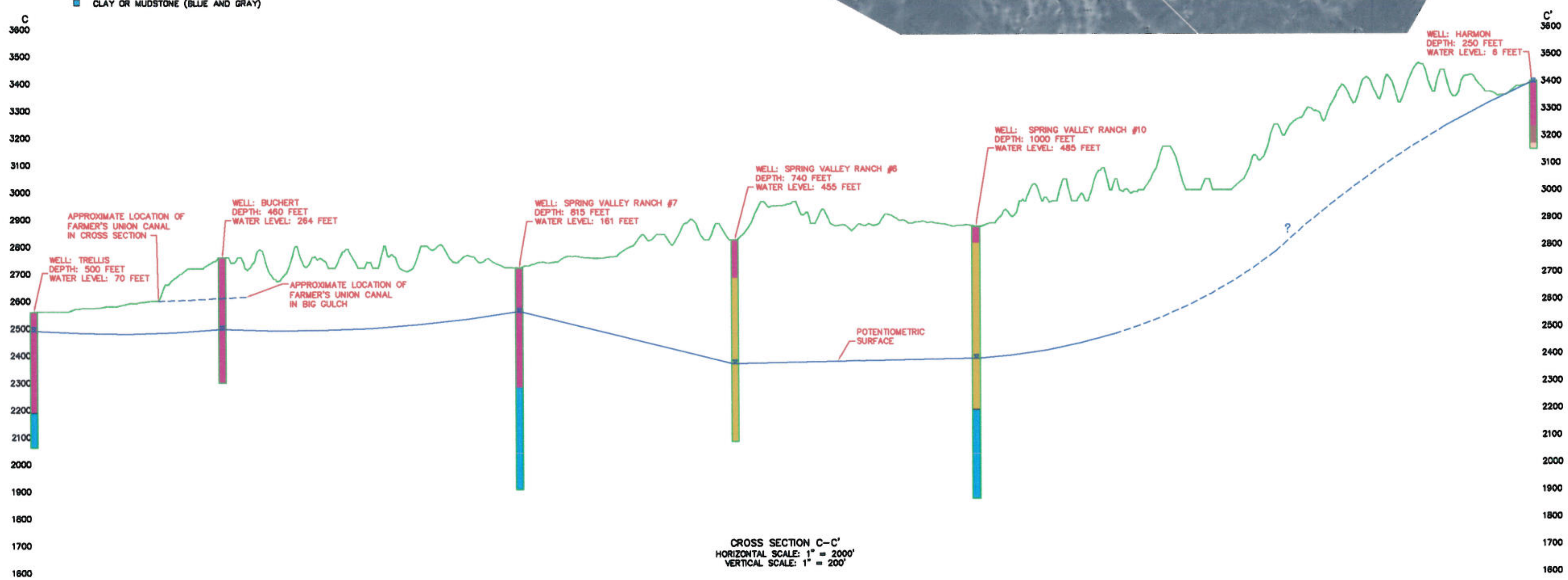
- CLAY OR MUDSTONE (BLUE AND GRAY)



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water resource consultants
600 East River Park Lane, Suite 105, Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

GEOLOGIC CROSS SECTIONS WESTERN WELL FIELD AREA
SPRING VALLEY RANCH
CROSS SECTION C-C'

TERRY SCANLAN
SPF WATER ENGINEERING, LLC
600 EAST RIVER PARK LANE, SUITE 105
BOISE, IDAHO 83706
PHONE: 208-383-4140

OWNER/DEVELOPER
SUNCOR DEVELOPMENT CO.
SUNCOR IDAHO, LLC
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EAGLE, IDAHO 83616

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ITEM	DESCRIPTION	DATE

Appendix A
Supplementary Data
Spring Valley Ranch Exploration Well SVR 6

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only	
Well ID No.	809803
Inspected by	
Twp	Rge Sec
1/4	1/4 1/4
Lat:	Long:

LE

1. WELL TAG NO. D 0030892
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 1/4 (10 acres) SE 1/4 (40 acres) NW 1/4 (160 acres)
Gov't Lot County Ada
Lat: Long:
Address of Well Site 1 mile SW of Willow Creek Rd
Big Gulch (Give at least name of road + Distance to Road or Landmark) City Eagle
Lt. Blk: Sub. Name

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	105	3150 #	overbore

Was drive shoe used? ☒Y ☐N Shoe Depth(s) 738'
Was drive shoe seal tested? ☐Y ☒N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	738'	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe Length of Tailpipe
Packer ☐Y ☐N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 PERFS
Screen Type & Method of Installation none per Row

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
560	580	1/4	360	8"	.250 WALL	☒	☐
580	600	1/4	360	8"	CASING	☒	☐
600	620	1/4	360	8"	"	☒	☐
620-640		1/4	360	8"	"	☒	

Filter Material	From	To	Weight / Volume	Placement Method
Continued on page 2				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
455 ft. below ground Artesian pressure lb.
Depth flow encountered ft. Describe access port or control devices:
Steel plate

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
175			6 hours

Water Temp. 80° Bottom hole temp.
Water Quality test or comments: Iron. 5 PH 7.5 Grains 2
Depth first Water Encounter 590'

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	10	sandy soil		
"	10	96	tan clay		
"	96	105	blue clay		
8	105	134	blue clay		
"	134	140	tan clay		
"	140	195	pea gravel & clay		
"	195	360	Lt gray sand & clay		
"	360	367	coarse sand & clay like pea gravel		
"	367	505	Fine & coarse sand		
"	505	540	larger pea gravel		
"	540	590	pea gravel w/ large sand quartz		
"	590	595	quartz sand	X	
"	595	605	Finer tan Sand		
"	605	620	quartz sand	X	
"	620	640	Finer sand	X	
"	640	645	quartz sand	X	
"	645	655	quartz sand & some pea gravel	X	
"	655	660	gravel & quartz sand	X	
"	660	670	big sand		
"	670	680	big sand	X	
"	680	685	big sand		
"	685	690	big sand	X	
"	690	730	big sand	X	
"	730	740	big sand	X	
			Due to heaving sand - a mixture of sand & cement was placed from 730' to 740		

RECEIVED
MAR 19 2004
WATER RESOURCES (Measurable)
WESTERN REGION

Completed Depth 730'
Date: Started 01-26-04 Completed 02-27-04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Company Name Adamson Pump & Drilling Rig No. 457
Principal Driller Dave Adamson Date 3-15-04
and
Driller or Operator II Dave Adamson Date 3-15-04
Operator I Date
Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No.
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0030892 pg 2
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 ____ 1/4 (10 acres) SE 1/4 (40 acres) NW 1/4 (160 acres)
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 1 mile SW of Willow Creek Rd
Big Gulch (Give at least name of road – Distance to Road or Landmark) City Eagle
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method

Was drive shoe used? ☐Y ☐N Shoe Depth(s)
Was drive shoe seal tested? ☐Y ☐N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐Y ☐N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 PERFS
Screen Type & Method of Installation PER ROW (360)

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
640	660	1/4	360	8"	.250 WALL	☒	☐
660	680	1/4	360	8"	CASING	☒	☐
680	700	1/4	360	8"	"	☒	☐
700 - 720		1/4	360	8"	"	X	

Filter Material	From	To	Weight / Volume	Placement Method
720 - 730				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
____ft. below ground Artesian pressure ____lb.
Depth flow encountered ____ft. Describe access port or control devices:

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments:
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N

Completed Depth ____ (Measurable)
Date: Started ____ Completed ____

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Adamson Pump & Drilling Firm No. 457
Principal Driller Dave Adamson Date 3-15-04
and
Driller or Operator II Dave Adamson Date 3-15-04
Operator I ____ Date ____

Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Exploration Hole SVR 6E

Spring Valley Ranch

Drilled by: Adamson Pump and Drilling.
Logged by: C. Feast/Feast Geosciences, LLC
Geophysical logs by: Not logged
Fluid level when logged: n/a
Casing when logged: n/a

Drilled Dates:
Drilling Method: Air Rotary
Borehole size: 8" (nom.) 0 - 740 ft.

Depth Drilled: 740 ft
Depth Logged: n/a
Static WL: ~ 445 ft. bgl

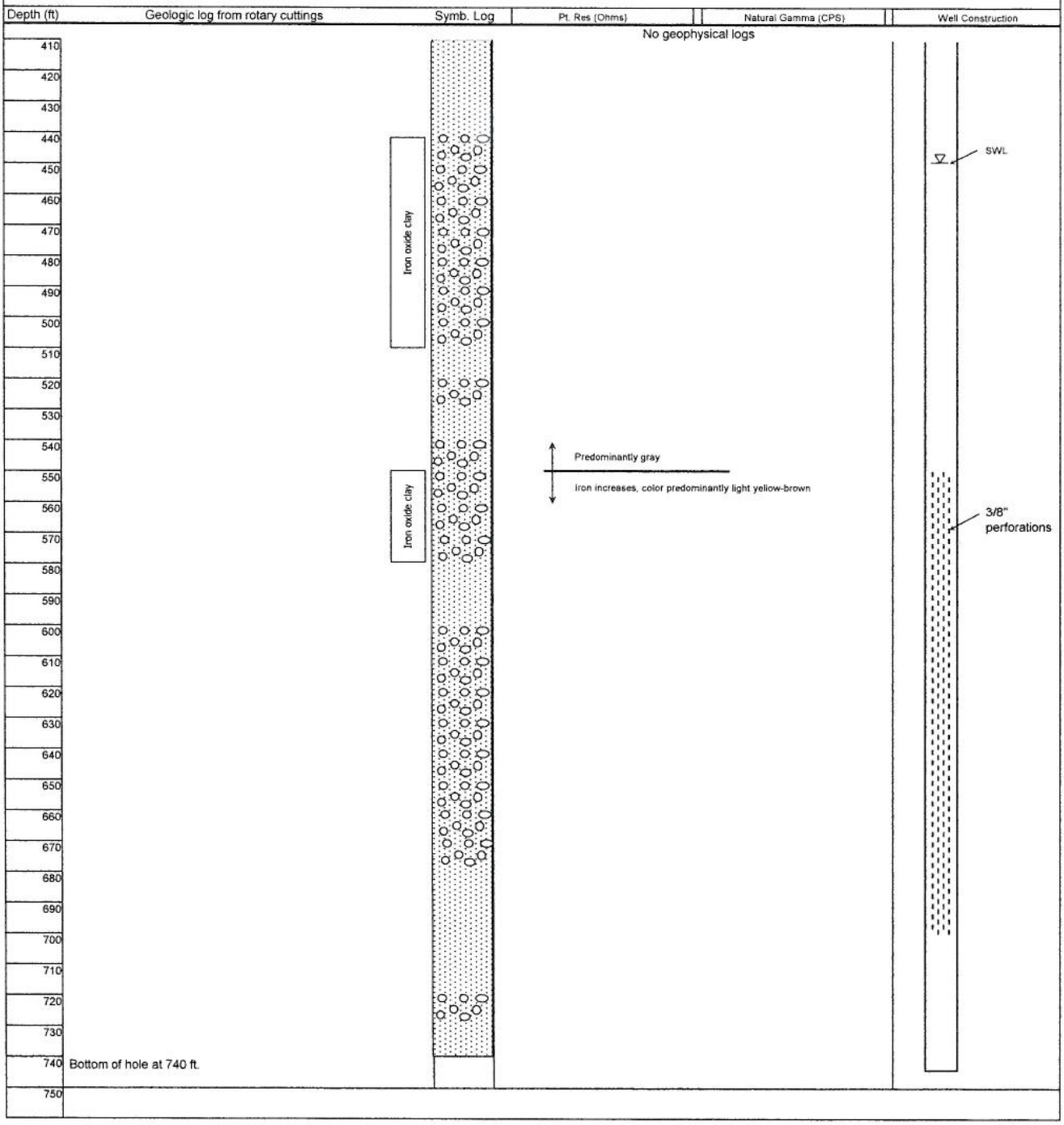
Location: Ada County, Idaho
T5N, R1W, SE1/4, NW1/4, Section 13
GL. Elevation: ~ 2820 ft. msl.

Depth (ft)	Geologic log from rotary cuttings	Symb. Log	Pt. Res (Ohms)	Natural Gamma (CPS)	Well Construction
	No geophysical logs				
0	Top soil over clay, soft, plastic, coarse qtz. sand grains, buff-yellow brown.				16" Overbore
10					
20					10" casing
30					
40					8", .250" wall steel casing
50					
60					
70					Bentonite slurry
80					
90	Silt, clayey, micaceous, medium gray.				
100					
110					
120					
130	Sand and gravel, coarse, subrounded qtz sand with fine to medium gravel, coarse gravel (1" minus) at numerous				
140	Color varies from brown to gray and occasional iron oxide clays as shown				
150					
160					
170					
180					
190	Clayey weathered granite cobbles				
200					
210					
220					
230					
240					
250					
260					
270					
280					
290					
300	Iron oxide clay				
310					
320					
330					
340					
350					
360					
370					
380					
390					
400					

Exploration Hole SVR 6E

Spring Valley Ranch

Drilled by: Adamson Pump and Drilling.	Drilled Dates:	Depth Drilled: 740 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Air Rotary	Depth Logged: n/a	T5N, R1W, SE1/4, NW1/4, Section 13
Geophysical logs by: Not logged	Borehole size: 8" (nom.) 0 - 740 ft.	Static WL: ~ 445 ft. bgl	GL. Elevation: ~ 2820 ft. msl.
Fluid level when logged: n/a			
Casing when logged: n/a			



Subj: **Exploration Well No. 6 (Big Gulch) temperature survey**
Date: 3/9/2004 5:46:34 PM Mountain Standard Time
From: TM SCANLAN
To: bob.taunton@suncoraz.com
CC: jerry.ellsworth@suncoraz.com, duane.black@suncoraz.com, cfeast@cableone.net

At the request of Idaho Department of Water Resources, Adamson conducted a temperature survey of Exploration Well No. 6 today. The results were surprising because the temperature decreased with depth as follows:

Depth (ft)	Temperature Degrees (F)
460	87.6
480	87.7
500	87.6
520	86.4
540	85.4
560	84.3
580	83.6
600	82.9
620	82.6
640	82.2
660	81.6
680	80.9
700	81.0
720	81.0
727	80.4

The test pump installation began this afternoon, and will be finished tomorrow. Apparently there is a delay in getting the generator for the test pump. Therefore, test puming will not occur until Friday or Monday.

AQUIFER TEST DATA

Well No: Spring Valley Ranch, Test well SVR 6 Qave = 358 gpm

Test conducted by: SPF Water Engineering and Adamson Pump and Drilling Company

Flow measured by: McCrometer flow meter - totalizer

Water levels measured by: well sounder Water level measure point: top of casing

MP elevation: 2 ft agl Static WL: 452.18 [ft]

Pump on: 3/23/2004 11:45 Pump off: 3/24/2004 11:45

Date	Time	t [min]	t' [min]	t/t'	Water Level Data				totalizer [ft^3]	Comments temperature data: F taken by spf, F-A taken by Adamson
					Ref [ft]	Measure [in]	WL [ft]	Drawdown [ft]		
3/23/2004	11:30	-					452.18		80	T=84.3F-A, slightly cloudy
3/23/2004	11:45	0					452.18	0.00		
3/23/2004	11:46	1					454.90	2.72		
3/23/2004	11:47	2					454.91	2.73		
3/23/2004	11:48	3					454.90	2.72		
3/23/2004	11:49	4					454.90	2.72		
3/23/2004	11:50	5					454.90	2.72		
3/23/2004	11:51	6					454.91	2.73		
3/23/2004	11:52	7					454.90	2.72		
3/23/2004	11:53	8					454.90	2.72		
3/23/2004	11:54	9					454.88	2.70		
3/23/2004	11:55	10					454.89	2.71		T=81.3F/83.4F-A,ph=7.13,EC/SC=192.7/184.1, clear
3/23/2004	11:57	12					454.88	2.70		
3/23/2004	11:59	14					454.88	2.70		
3/23/2004	12:01	16					454.88	2.70		
3/23/2004	12:03	18					454.89	2.71		
3/23/2004	12:05	20					454.89	2.71		T=81.3F/83.4F-A,ph=7.35,EC/SC=190.4/182.1
3/23/2004	12:07	22					454.89	2.71		
3/23/2004	12:09	24					454.89	2.71		
3/23/2004	12:11	26					454.89	2.71		
3/23/2004	12:13	28					454.89	2.71	1480	T=81.1F/83.6F-A,ph=7.48,EC/SC=189.7/181.7
3/23/2004	12:15	30					454.89	2.71		
3/23/2004	12:20	35					454.89	2.71		T=81.5F/83.5F-A,ph=7.58,EC/SC=189.5/180.9, clear
3/23/2004	12:25	40					454.90	2.72	2200	T=81.3F/82.9F-A,ph=7.58,EC/SC=189.2/180.9
3/23/2004	12:30	45					454.89	2.71		T=81.3F/82.9F-A,ph=7.6,EC/SC=188.4/180.1
3/23/2004	12:35	50					454.89	2.71		
3/23/2004	12:40	55					454.89	2.71	2920	T=81.3F/82.8F-A,ph=7.6,EC/SC=188.4/180.2
3/23/2004	12:45	60					454.89	2.71		T=81.1F/83F-A,ph=7.64,EC/SC=188.4/180.3
3/23/2004	12:50	65					454.88	2.70		T=81.5F/83.1F-A,ph=7.67,EC/SC=188.4/180.1
3/23/2004	12:55	70					454.89	2.71	3630	T=81.5F/83.1F-A,ph=7.68,EC/SC=188.6/180.1, clear
3/23/2004	13:00	75					454.91	2.73		T=81.1F/82.8F-A,ph=7.67,EC/SC=188.1/180.1
3/23/2004	13:05	80					454.91	2.73		T=81.1F/82.4F-A,ph=7.68,EC/SC=188.6/180.6
3/23/2004	13:10	85					454.92	2.74	4350	T=81.1F/82.3F-A,ph=7.65,EC/SC=188.5/180.5
3/23/2004	13:15	90					454.91	2.73		
3/23/2004	13:25	100					454.91	2.73		T=81.1F/82.7F-A,ph=7.62,EC/SC=188.9/180.9, clear
3/23/2004	13:35	110					454.90	2.72	5790	
3/23/2004	13:45	120					454.90	2.72		T=81.1F/82.7F-A,ph=7.74,EC/SC=189.4/181.4
3/23/2004	13:55	130					454.90	2.72		
3/23/2004	14:05	140					454.90	2.72	7220	T=81.1F/82.4F-A,ph=7.62,EC/SC=190/182.1
3/23/2004	14:15	150					454.89	2.71		T=81.1F/82.3F-A,ph=7.64,EC/SC=190/181.7
3/23/2004	14:25	160					454.91	2.73		T=81.3F/81.5F-A,ph=7.65,EC/SC=190.5/182.1
3/23/2004	14:35	170					454.90	2.72	8660	T=81.1F/81.9F-A,ph=7.67,EC/SC=190.2/182.2
3/23/2004	14:45	180					454.89	2.71	9410	T=81.9F-A, Adamson Pump and Drilling measurements
3/23/2004	15:00	195					454.96	2.78	10830	T=82.6F-A
3/23/2004	15:30	225					454.92	2.74	12240	T=81.8F-A
3/23/2004	16:00	255					454.92	2.74	13660	T=81.4F-A
3/23/2004	16:30	285					454.92	2.74	15120	T=81.2F-A
3/23/2004	17:00	315					454.98	2.80	17880	T=81.9F-A
3/23/2004	18:00	375					455.00	2.82	20950	T=81.7F-A
3/23/2004	19:00	435					455.00	2.82	23740	T=81F-A
3/23/2004	20:00	495					455.00	2.82	29340	T=80.2F-A
3/23/2004	22:00	615					455.00	2.82	35330	T=81.1F-A
3/24/2004	0:00	735					455.00	2.82	41540	T=79.7F-A
3/24/2004	2:00	855					455.00	2.82	46890	T=81.2F-A
3/24/2004	4:00	975					455.00	2.82	52720	T=80.8F-A
3/24/2004	6:00	1095					455.00	2.82	58070	T=81.5F-A
3/24/2004	8:00	1215					455.00	2.82	60980	T=81.9F-A
3/24/2004	9:00	1275					455.00	2.82	63900	T=81.8F-A
3/24/2004	10:00	1335					455.00	2.82	66650	T=81.2F-A
3/24/2004	11:00	1395					455.00	2.82	68910	T=80.9F/81.6F-A,ph=7.33,EC/SC=197.7/189.9, ph not cal.
3/24/2004	11:45	1440					455.00	2.82		recovery
3/24/2004	11:46	1441	1	1441			451.23	-0.95		
3/24/2004	11:46:30	1441.5	1.5	961			451.70	-0.48		
3/24/2004	11:47	1442	2	721			451.94	-0.24		
3/24/2004	11:47:30	1442.5	2.5	577			452.34	0.16		
3/24/2004	11:48	1443	3	481			452.35	0.17		
3/24/2004	11:48:30	1443.5	3.5	412			452.34	0.16		
3/24/2004	11:49	1444	4	361			452.34	0.16		
3/24/2004	11:49:30	1444.5	4.5	321			452.34	0.16		
3/24/2004	11:50	1445	5	289			452.34	0.16		

AQUIFER TEST DATA

Well No: Spring Valley Ranch, Test well SVR 6 Qave = 358 gpm

Test conducted by: SPF Water Engineering and Adamson Pump and Drilling Company

Flow measured by: McCrometer flow meter - totalizer

Water levels measured by: well sounder Water level measure point: top of casing

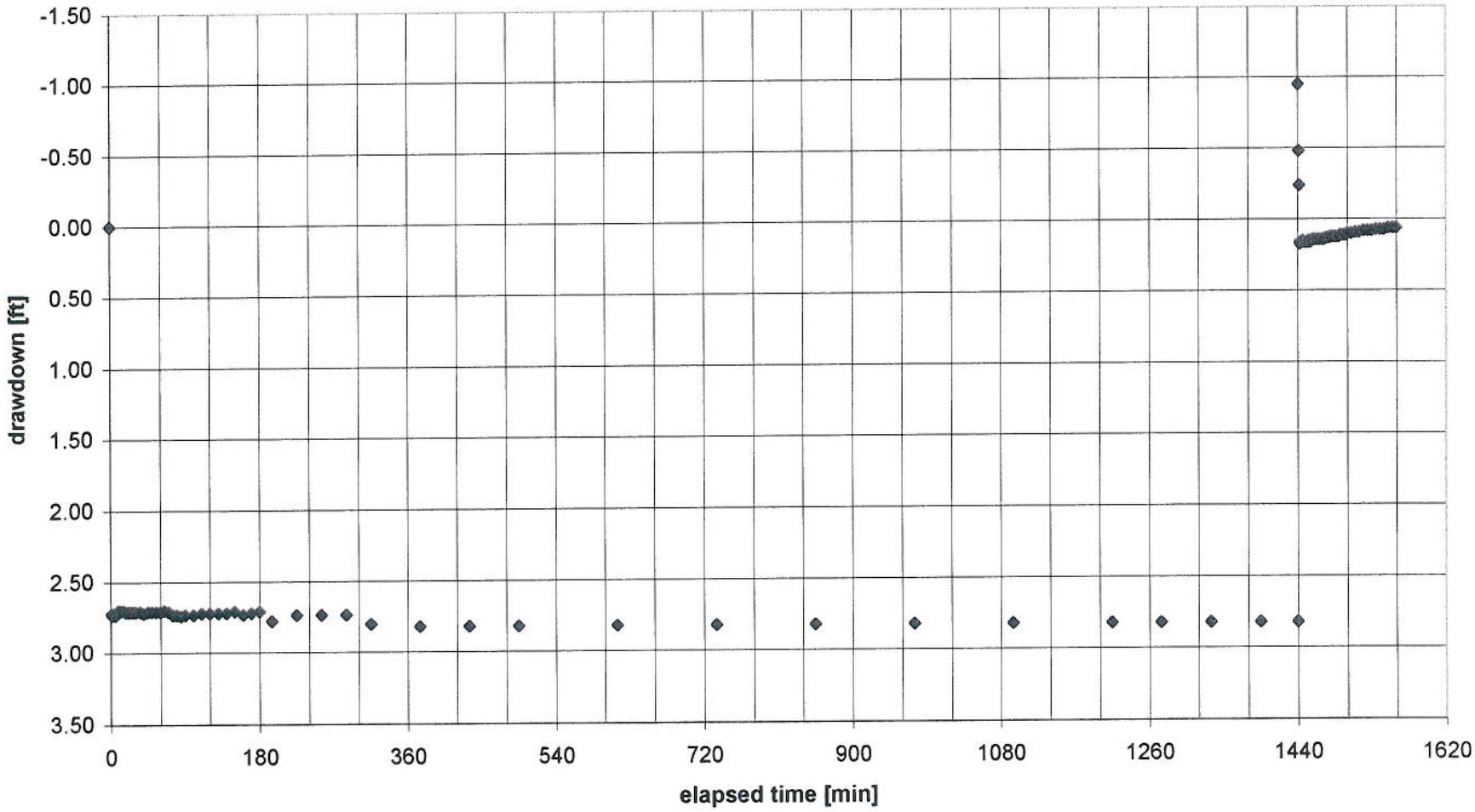
MP elevation: 2 ft agl Static WL: 452.18 [ft]

Pump on: 3/23/2004 11:45 Pump off: 3/24/2004 11:45

Date	Time	t [min]	t' [min]	t/t'	Water Level Data				totalizer [ft^3]	Comments temperature data: F taken by spf, F-A taken by Adamson
					Ref [ft]	Measure [in]	WL [ft]	Drawdown [ft]		
3/24/2004	11:51	1446	6	241			452.34	0.16		
3/24/2004	11:52	1447	7	207			452.33	0.15		
3/24/2004	11:53	1448	8	181			452.34	0.16		
3/24/2004	11:54	1449	9	161			452.34	0.16		
3/24/2004	11:55	1450	10	145			452.34	0.16		
3/24/2004	11:56	1451	11	132			452.34	0.16		
3/24/2004	11:57	1452	12	121			452.34	0.16		
3/24/2004	11:58	1453	13	112			452.33	0.15		
3/24/2004	11:59	1454	14	104			452.33	0.15		
3/24/2004	12:00	1455	15	97			452.34	0.16		
3/24/2004	12:01	1456	16	91			452.33	0.15		
3/24/2004	12:02	1457	17	86			452.33	0.15		
3/24/2004	12:03	1458	18	81			452.32	0.14		
3/24/2004	12:04	1459	19	77			452.32	0.14		
3/24/2004	12:05	1460	20	73			452.32	0.14		
3/24/2004	12:07	1462	22	66			452.32	0.14		
3/24/2004	12:09	1464	24	61			452.32	0.14		
3/24/2004	12:11	1466	26	56			452.32	0.14		
3/24/2004	12:13	1468	28	52			452.32	0.14		
3/24/2004	12:15	1470	30	49			452.32	0.14		
3/24/2004	12:17	1472	32	46			452.32	0.14		
3/24/2004	12:19	1474	34	43			452.31	0.13		
3/24/2004	12:21	1476	36	41			452.31	0.13		
3/24/2004	12:23	1478	38	39			452.31	0.13		
3/24/2004	12:25	1480	40	37			452.30	0.12		
3/24/2004	12:27	1482	42	35			452.30	0.12		
3/24/2004	12:29	1484	44	34			452.30	0.12		
3/24/2004	12:31	1486	46	32			452.30	0.12		
3/24/2004	12:33	1488	48	31			452.30	0.12		
3/24/2004	12:35	1490	50	30			452.30	0.12		
3/24/2004	12:37	1492	52	29			452.29	0.11		
3/24/2004	12:39	1494	54	28			452.29	0.11		
3/24/2004	12:41	1496	56	27			452.29	0.11		
3/24/2004	12:43	1498	58	26			452.29	0.11		
3/24/2004	12:45	1500	60	25			452.28	0.10		
3/24/2004	12:50	1505	65	23			452.28	0.10		
3/24/2004	12:55	1510	70	22			452.27	0.09		
3/24/2004	13:00	1515	75	20			452.27	0.09		
3/24/2004	13:05	1520	80	19			452.26	0.08		
3/24/2004	13:10	1525	85	18			452.26	0.08		
3/24/2004	13:15	1530	90	17			452.26	0.08		
3/24/2004	13:20	1535	95	16			452.25	0.07		
3/24/2004	13:25	1540	100	15			452.25	0.07		
3/24/2004	13:30	1545	105	15			452.25	0.07		
3/24/2004	13:35	1550	110	14			452.24	0.06		
3/24/2004	13:40	1555	115	14			452.24	0.06		
3/24/2004	13:45	1560	120	13			452.24	0.06		

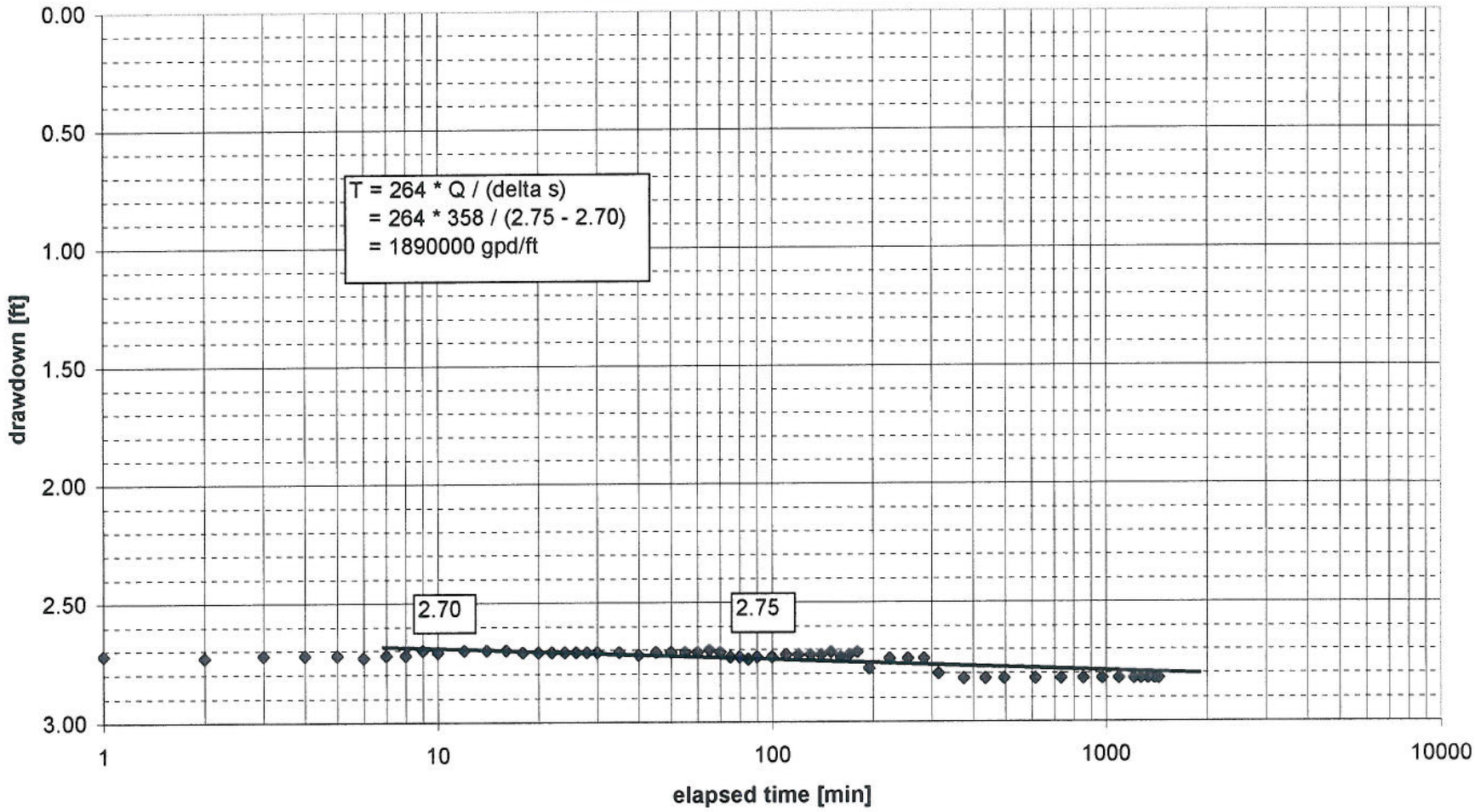
Drawdown and Recovery

Spring Valley Ranch
Test Well SVR 6, Qave = 358 gpm
Test date: March 23-24, 2004



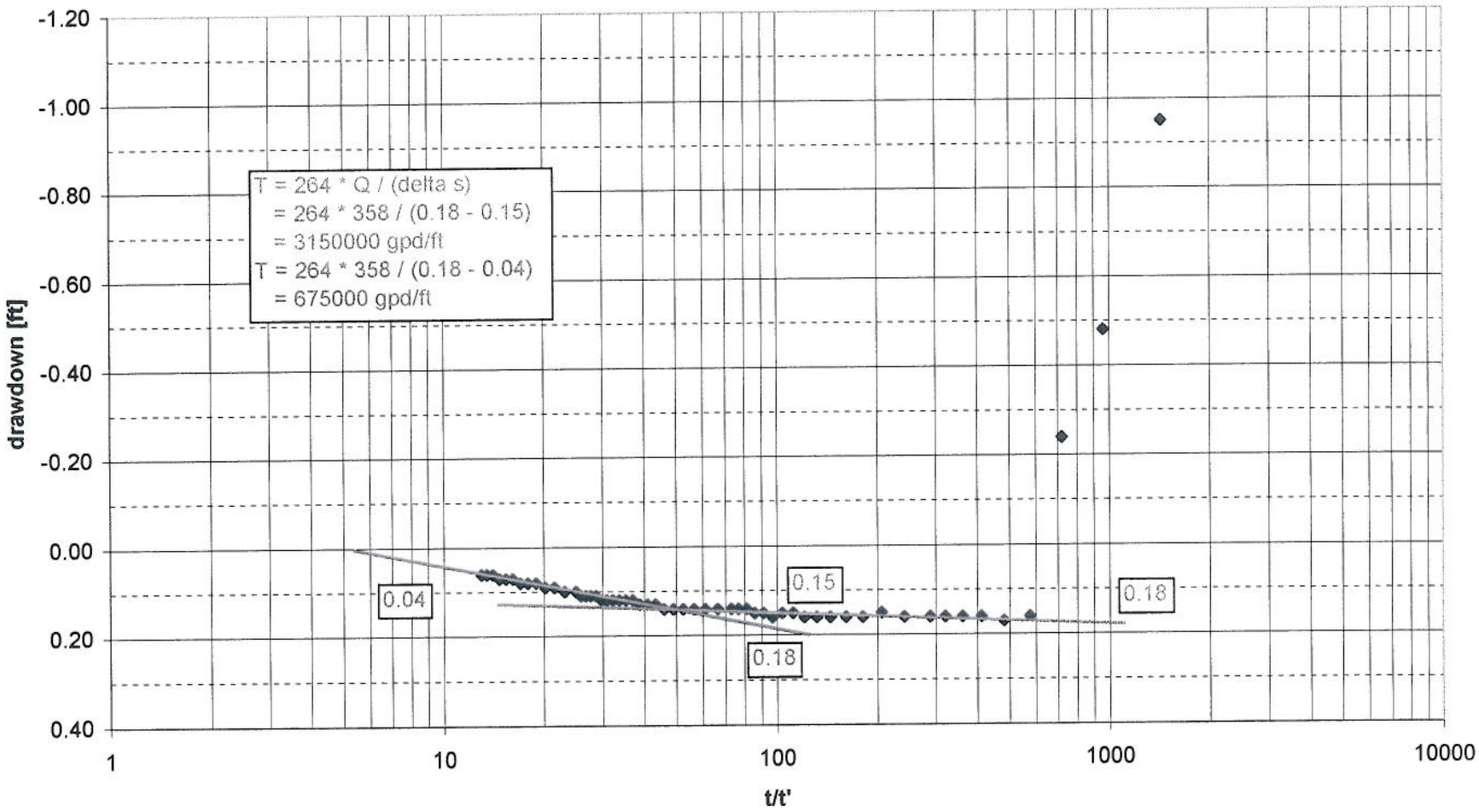
Time - Drawdown

Spring Valley Ranch
Test well SVR 6, Qave = 358 gpm
Test date: March 23-24, 2004



Time - Recovery

Spring Valley Ranch
Test well SVR 6
Test date: March 23-24, 2004



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

http://www.analyticallaboratories.com

Attn: TERRY SCANLAN
SCANLAN ENGINEERING
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: M MOORE
Submitted By: M MOORE

Source of Sample:
BIG GULCH ~~#8~~
Exploration well 6
(Site W8)

Time of Collection: 16:00
Date of Collection: 3/16/2004
Date Received: 3/17/2004
Report Date: 3/31/2004

PWS:

Laboratory Analysis Report

Sample Number: 0407816

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Antimony Furnace		< 0.005	mg/L	0.005	SM 3113 B	3/24/2004	DMB
Arsenic Furnace		0.067	mg/L	0.003	SM 3113 B	3/19/2004	DMB
Barium, Ba		< 0.05	mg/L	0.05	EPA 200.7	3/19/2004	JH
Beryllium Furnace		< 0.0005	mg/L	0.0005	SM 3113 B	3/27/2004	DMB
Cadmium Furnace		< 0.0005	mg/L	0.0005	SM 3113 B	3/31/2004	DMB
Calcium, Ca		9.71	mg/L	0.10	EPA 200.7	3/20/2004	JH
Chromium Furnace		< 0.002	mg/L	0.002	SM 3113 B	3/23/2004	DMB
Iron, Fe		0.09	mg/L	0.05	EPA 200.7	3/18/2004	JH
Lead Furnace		< 0.005	mg/L	0.005	SM 3113 B	3/22/2004	DMB
Magnesium, Mg		0.69	mg/L	0.10	EPA 200.7	3/20/2004	JH
Manganese, Mn		< 0.05	mg/L	0.05	EPA 200.7	3/18/2004	JH
Mercury, Hg		< 0.0002	mg/L	0.0002	EPA 245.1	3/24/2004	SS
Molybdenum, Mo		< 0.05	mg/L	0.05	EPA 200.7	3/31/2004	JH
Nickel, Ni		< 0.02	mg/L	0.02	EPA 200.7	3/22/2004	JH
Potassium, K		1.5	mg/L	0.5	EPA 200.7	3/20/2004	JH
Selenium Furnace		< 0.005	mg/L	0.005	SM 3113 B	3/22/2004	DMB
Silica		36.2	mg/L	0.3	EPA 200.7	3/31/2004	JH
Sodium, Na		27.8	mg/L	0.10	EPA 200.7	3/20/2004	JH
Thallium Furnace		< 0.002	mg/L	0.002	SM 3113 B	3/28/2004	DMB
Vanadium, V		< 0.05	mg/L	0.05	EPA 200.7	3/31/2004	JH

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Laboratory Analysis Report

Sample Number: 0407816

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Nitrate (as N)		1.09	mg/L	0.20	EPA 300.0	3/18/2004	WW
Ammonia Direct (as N)		0.13	mg/L	0.04	EPA 350.1	3/22/2004	WW
Nitrite (as N)		0.02	mg/L	0.01	EPA 353.2	3/16/2004	ARR
Total Phosphate (as P)		< 0.05	mg/L	0.05	EPA 365.4	3/23/2004	KDH
Alkalinity		58.8	mg/L Ca		EPA 310.1	3/25/2004	ARR
Bicarbonate		58.8	mg/L		SM 2320	3/25/2004	ARR
Chloride, Cl		5	mg/L	1	EPA 300.0	3/18/2004	WW
Fluoride, F		0.95	mg/L	0.10	EPA 300.0	3/22/2004	WW
Hardness		< 5.0	mg/L	5.0	SM 2340	3/19/2004	ARR
Sulfate, SO4		13	mg/L	1	EPA 300.0	3/18/2004	WW
Sulfide, Dissolved (as H2S)		<0.05	mg/L	0.05	SM 4500-S2 D	3/18/2004	DLR
Total Dissolved Solids		98	mg/L	25	EPA 160.1	3/20/2004	CS
Total Suspended Solids		<3	mg/L	3	EPA 160.2	3/19/2004	CS

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.
If you have any questions concerning this report,
please contact: **Michael Moore**

Michael D. Moore

LAB FEDERAL ID#: **ID00020**	LAB SAMPLE #: **0407816**
DATE LAB REC'D SAMPLE: 3/17/2004	DATE REPORTED BY LAB: 3/31/2004
COMPLIANCE SAMPLE YES ☐ NO	REPLACEMENT SAMPLE ☐
COLLECTION DATE: 3/16/2004	COLLECTION TIME: (24 hour clock) 16:00
SAMPLE TYPE: CO-confirmation ☐ RP-repeat ☐ RT-routine DU-duplicate ☐ SP-special ☐ Other	
PWS#:	PWS NAME: SCANLAN ENGINEERING
SAMPLING POINT/LOCATION: BIG GULCH #8	TAG #/FACILITY ID:
COLLECTOR'S NAME: M MOORE	CONTACT PHONE # (208) 383-4140

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

http://www.analyticallaboratories.com

PUBLIC DRINKING WATER SYSTEM INORGANIC CHEMICAL (IOC) ANALYSIS REPORT:

Phase II								Phase V							
FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst	FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst
1010	Barium	ND	EPA 200.7	2	0.05	3/19/2004	JH	1085	Thallium	ND	SM 3113 B	0.002	0.002	3/28/2004	DMB
1015	Cadmium	ND	SM 3113 B	0.005	0.0005	3/31/2004	DMB	1075	Beryllium	ND	SM 3113 B	0.004	0.0005	3/27/2004	DMB
1020	Chromium	ND	SM 3113 B	0.1	0.002	3/23/2004	DMB	1074	Antimony	ND	SM 3113 B	0.006	0.005	3/24/2004	DMB
1035	Mercury	ND	EPA 245.1	0.002	0.0002	3/24/2004	SS	1036	Nickel	ND	EPA 200.7	n/a	0.02	3/22/2004	JH
1038	Ttl(N02/N03)	---		10				Other IOCs							
1040	Nitrate	1.09	EPA 300.0	10	0.2	3/18/2004	WW	1052	Sodium	27.8	EPA 200.7	n/a	0.1	3/20/2004	JH
1041	Nitrite	0.02	EPA 353.2	1.0	0.01	3/16/2004	ARR	1025	Fluoride	0.95	EPA 300.0	4.0	0.1	3/22/2004	WW
1045	Selenium	ND	SM 3113 B	0.05	0.005	3/22/2004	DMB	1005	Arsenic	0.067	SM 3113 B	0.05	0.003	3/19/2004	DMB
1024	Cyanide	---		0.2											
Secondary IOCs (optional)															
1050	Silver	---		0.1				2905	Surfactants	---					
1049	Silica, As SiO2	---						1997	Langlier Index	---					
1042	Potassium	1.5	EPA 200.7		0.5	3/20/2004	JH	1930	Dissolved Solids	98	EPA 160.1	500	25	3/20/2004	CS
1032	Manganese	ND	EPA 200.7	0.05	0.05	3/18/2004	JH	1927	Alkalinity as CaC03	58.8	EPA 310.1			3/25/2004	ARR
1031	Magnesium	0.69	EPA 200.7		0.1	3/20/2004	JH	1926	Conductivity uS/cm	---					
1028	Iron	0.09	EPA 200.7	0.3	0.05	3/18/2004	JH	1925	pH	---		6.5-8.			
1027	Hydrogen Sulfide	ND	SM 4500-S		0.05	3/18/2004	DLR	1920	Odor (Threshold #)	---		3			
1022	Copper	---		1.0				1915	Hardness as CaC03	ND	SM 2340		5	3/19/2004	ARR
1017	Chloride	5	EPA 300.0	250	1	3/18/2004	WW	1905	Color	---		15c.u.			
1016	Calcium	9.71	EPA 200.7		0.1	3/20/2004	JH	1095	Zinc	---		5			
1003	Ammonia as N	0.13	EPA 350.1		0.04	3/22/2004	WW	1055	Sulfate	13	EPA 300.0	250	1	3/18/2004	WW
1002	Aluminum	---		0.05-											

TERRY SCANLAN
SCANLAN ENGINEERING
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

*Reported in mg/L unless otherwise noted
ND = Not detected within sensitivity of instrument
--- = No analysis performed
MDL = Method detection limit

Michael A. Moore
Signature of Laboratory Supervisor

4/5/2004
Date

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0407817

Attn: TERRY SCANLAN
SCANLAN ENGINEERING
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: M MOORE
Submitted By: M MOORE

Source of Sample:
BIG GULCH #8
SVR 6

Time of Collection: 16:00
Date of Collection: 3/16/2004
Date Received: 3/17/2004
Report Date: 4/14/2004

PWS:

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 04/13/04.
*ND=NONE DETECTED @ 0.2 pCi/L.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Uranium-Total		3	pCi/L	0.2	EPA 908.1	3/26/2004	ELI

Michael 11/16/22

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Lab Federal ID#:	WY00002	Lab Sample	0407817
Date Lab Rec'd Sample:	3/17/2004	Date Reported by Lab:	04/02/04
Compliance Sample:	X Yes ☐ No	Replacement Sample	☐
Collection Date:	3/16/2004	Time Collected:	16:00
Sample Type:	☐ CO-confirmation ☐ RP-repeat		
	X RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other		
PWS #:		PWS Name:	SCANLAN ENGINEERING
Sampling Point/Location	BIG GULCH #8 SURG	Tag # / Facility ID:	
Collector's Name:	M MOORE	Contact Phone #:	(208)342-5515

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

PUBLIC DRINKING WATER SYSTEM RADIOLOGICAL ANALYSIS REPORT

FRDS Number	CONTAMINANT	Result ug/L	Result pCi/L	MCL	Analysis Date	Analyst	Method
4002	**Gross Alpha Activity** *(Includes Radium and Uranium)*		--				
4006	**Uranium** (measure if gross alpha exceeds 15 pCi/L; activity = 1.0 x concentration ug/L	3	3	20	3/26/2004	ELI	EPA 908.1
4000	**Adjusted Gross Alpha** (Subtract Uranium activity level from Gross Alpha Activity above)		--				
4020	**Radium-226** *(Required if Alpha activity is greater than 5pCi/L)*		--				
4030	**Radium-228** (measure if radium 226 exceeds 3 pCi/L)		--				
4010	**Total Measured Radium** (Sum of Ra-226 and Ra-228)		--				
4100	**Beta/Photon Activity** *(Measure major constituents if activity exceeds 50 pCi/L)*		--				

ND = Not detected within sensitivity of instrument
-- = No analysis performed for this contaminant

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 04/13/04.
*ND=NONE DETECTED @ 0.2 pCi/L.

Michael M. Tyler 4/16/04
Lab Supervisor's Signature Date

CC:

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0405853

Attn: TERRY SCANLAN
SCANLAN ENGINEERING
600 E RIVER PARK LA STE 105
BOISE, ID 83706

Collected By: T SCANLAN
Submitted By: T SCANLAN

Source of Sample:
BIG GULCH WELL #6
(Air lift Sample)

Time of Collection: 16:00
Date of Collection: 2/26/2004
Date Received: 2/26/2004
Report Date: 3/1/2004

PWS:

SAMPLE RCVD IN MICROBIOLOGICAL TESTING BOTTLES RINSED TO REMOVE SODIUM THIOSULFATE PRESERVATIVE

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		0 023	mg/L	0 003	SM 3113 B	2/29/2004	DMB
Fluoride, F		1 09	mg/L	0.10	EPA 300.0	2/27/2004	WW

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs

If you have any questions about this report, or any future analytical needs, please contact. Michael Moore

Big Gulch / Western Well
Well # 6E 1053

Printed 12/30/2003
Drilling Permit No. 809803
Well Tag No. D0030892
Well ID # 380535
Water Right No.
Receipt #
Approved Date 12/22/2003

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
DRILLING PERMIT

Relationship: Applicant
Name: SPRING VALLEY DEVELOPMENT LLC
Address 485 EAST RIVERSIDE DR
EAGLE ID 83616
Phone: (208)939-0343

Proposed Well Location: Township 05N, Range 01W, Section 13, SE, NW
COUNTY ADA

Street Address of Well Site: 1 MILE SW OF WILLOW CREEK RD BIG GULCH
EAGLE ID

Proposed Use of Well: Test

Well Construction Information:

A. New Well
B. Proposed Surface Diameter: 8 inches. Proposed Depth 800 Feet
C. Anticipated Bottom Hole Temperature: 85F and less

Construction Start Date: Dec 22 2003

Anticipated Well Drilling Company: ADAMSON PUMP & DRILLING (No. 457)

Applicant's Signature: See original Apl. Date 12/14/03

Title: RW

Well ID # 380535

Well Tag No. D0030892

ACTION OF THE DEPARTMENT OF WATER RESOURCES

This permit is Approved on Monday, December 22, 2003.

1. This drilling permit is valid for two (2) months from the approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the local Health District or the Idaho Department of Environmental Quality which may be required prior to construction of this well. The local Health District should be contacted for septic tank/drainfield locations. Domestic wells must not be drilled closer than 100 ft. from any drainfield and 50 ft. from any septic tank. Public Water Supply wells must not be drilled closer than 100 ft. from any drainfield or septic tank.
3. The well shall be constructed by a driller currently licensed in the state of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals that may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho. If the well being drilled is associated with approved water rights(s) use of the well must comply with conditions of said water right(s).
7. If a bottom hole temperature of 85 Degrees F (29.44 oC) or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department of Water Resources immediately.
8. Idaho Code, S 55-2201 - 55-2210 requires the applicant and/or its contractors to contact "Dig-line" (Dig-Line is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "Dig-Line " Number for this location is 1-800-342-1585
9. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.
10. This drilling permit has been approved for construction or drilling of an exploratory well intended to be used for collecting geologic, hydrologic or water quality data.

11. No water shall be produced from this well or any fluid injected into this well without specific written authorization from the Department.
12. Any surface casing installed in this well shall not exceed 8 inches nominal diameter.
13. All casing strings installed in this well shall be sealed their entire length with approved seal material and by positive means of placement unless otherwise authorized by this drilling permit.
14. A drilling prospectus including a schematic diagram and construction narrative describing all pertinent features of the well including drilling methods, seal material and placement methods, casing schedules and specifications shall be submitted for review by the department and attached to this drilling permit prior to the start of construction.
15. No casing installed in this well shall be drilled and driven through multiple aquifers, unless it is completely removed and the borehole is properly sealed or the casing is perforated at appropriate intervals and pressure grouted with approved grout. Drilling and driving casing may be allowed above the water table or where multiple aquifers are

Well ID # 380535

not encountered provided that the casing is sealed as required by administrative rules.

16. This well shall be properly plugged in accordance with a plan approved by the department at least 30 days prior to the expiration of the bond.
17. The bond secured for abandonment of this well shall be valid for the entire time the well remains open. The Department will give the well owner 60 days notice prior to the expiration of the bond that the well must be properly plugged. If the well owner has not properly plugged the well at least 30 days prior to the expiration of the bond, the Director may commence action to attach the bond and hire a licensed driller to properly plug the well.
18. Drilling of this well shall not commence until the Department has received a document from the surety company or bank stating that the bond is in full force and effect and the Department has determined the amount of the bond is sufficient.

19. This drilling permit is not valid unless the well owner has secured a bond in favor of the Director in an amount sufficient for proper plugging and abandonment of this well. The bond shall remain in effect and accessible by the Director until this well is plugged. The bond amount for this well shall be at least $7200

Signature of Authorized Dept. Representative

Sr. WR Agent
Title

Appendix B
Supplementary Data
Spring Valley Ranch Exploration Well SVR 7

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
SPRING VALLEY RANCH #7

Time of Collection: 12:45
Date of Collection: 4/21/2004
Date Received: 4/22/2004
Report Date: 5/25/2004

PWS:

Laboratory Analysis Report

Sample Number: 0412351

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Antimony Furnace	0.006	<0.005	mg/L	0.005	SM 3113 B	5/13/2004	DMB
Arsenic Furnace	0.05	<0.005	mg/L	0.005	SM 3113 B	4/29/2004	JH
Barium, Ba	2	<0.05	mg/L	0.05	EPA 200.7	4/27/2004	JH
Beryllium Furnace	0.004	<0.0005	mg/L	0.0005	SM 3113 B	5/10/2004	DMB
Calcium, Ca	UR	29.1	mg/L	0.10	EPA 200.7	4/23/2004	JH
Chromium Furnace	0.1	<0.002	mg/L	0.002	SM 3113 B	5/6/2004	DMB
Iron, Fe	UR	0.11	mg/L	0.05	EPA 200.7	4/26/2004	JH
Magnesium, Mg	UR	8.19	mg/L	0.10	EPA 200.7	4/23/2004	JH
Manganese, Mn	UR	<0.05	mg/L	0.05	EPA 200.7	4/26/2004	JH
Mercury, Hg	0.002	<0.0002	mg/L	0.0002	EPA 245.1	4/29/2004	SS
Nickel, Ni	UR	<0.02	mg/L	0.02	EPA 200.7	4/26/2004	JH
Potassium, K	UR	2.0	mg/L	0.5	EPA 200.7	4/23/2004	JH
Sodium, Na	UR	22.9	mg/L	0.10	EPA 200.7	4/23/2004	JH
Thallium Furnace	0.002	<0.002	mg/L	0.002	SM 3113 B	5/10/2004	DMB
Cadmium Furnace	0.005	<0.0005	mg/L	0.0005	SM 3113 B	5/22/2004	DMB
Ammonia Direct (as N)	UR	<0.04	mg/L	0.04	EPA 350.1	4/28/2004	WW

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No. 811501
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0031062
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr Suite # 300
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 23 ____ 1/4 (10 acres) NE 1/4 (40 acres) SW 1/4 (160 acres)
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site Big Gulch Sw of Wilson Creek Rd (Give at least name of road + Distance to Road or Landmark) City Eagle
Lt. ____ Blk. ____ Sub. Name

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other Test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:
☐ Air Rotary ☐ Cable ☒ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
30% Grout	815	380	—	Pressure Grout
30% Grout	240	0	—	Pressure Grout

Was drive shoe used? ☐Y ☐N Shoe Depth(s)
Was drive shoe seal tested? ☐Y ☐N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	278	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐Y ☐N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method Perf. 8" Casing 10 FT
Screen Type & Method of Installation Shutter Screen 60 FT

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
280	340	1/8	Many	8"	Steel	☐	☐
340	350	1/8	60	8"	Steel	☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
5/16 Pea Gravel	380	242	—	Pour

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
161 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices:
Well cap

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
100 - 200			1 hour

Water Temp. 72° Bottom hole temp.
Water Quality test or comments: Iron .5 PH 7.5 Grains 5 Depth first Water Encounter

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	3	top soil & clay		
"	3	30	coarse sand		
"	30	55	brown clay		
"	55	60	sand		
"	60	70	brown clay		
"	70	120	soft & hard clay layers		
"	120	130	sand & clay		
"	130	135	coarse sand		
"	135	150	clay		
"	150	190	clay w/some sand layers		
"	190	200	sand		
"	200	210	clay w/sand		
"	210	280	coarse sand w/little clay		
"	280	290	coarse sand		
"	290	340	coarse sand		
"	340	350	bluish coarse sand w/some wood		
"	350	380	coarse blue sand		
"	380	440	coarse blue sand		
"	440	470	blue clay		
"	470	815	blue clay		

RECEIVED
APR 19 2004
WATER RESOURCES
WESTERN REGION

Completed Depth 350' (Measurable)
Date: Started 3/10/04 Completed 4.10.04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

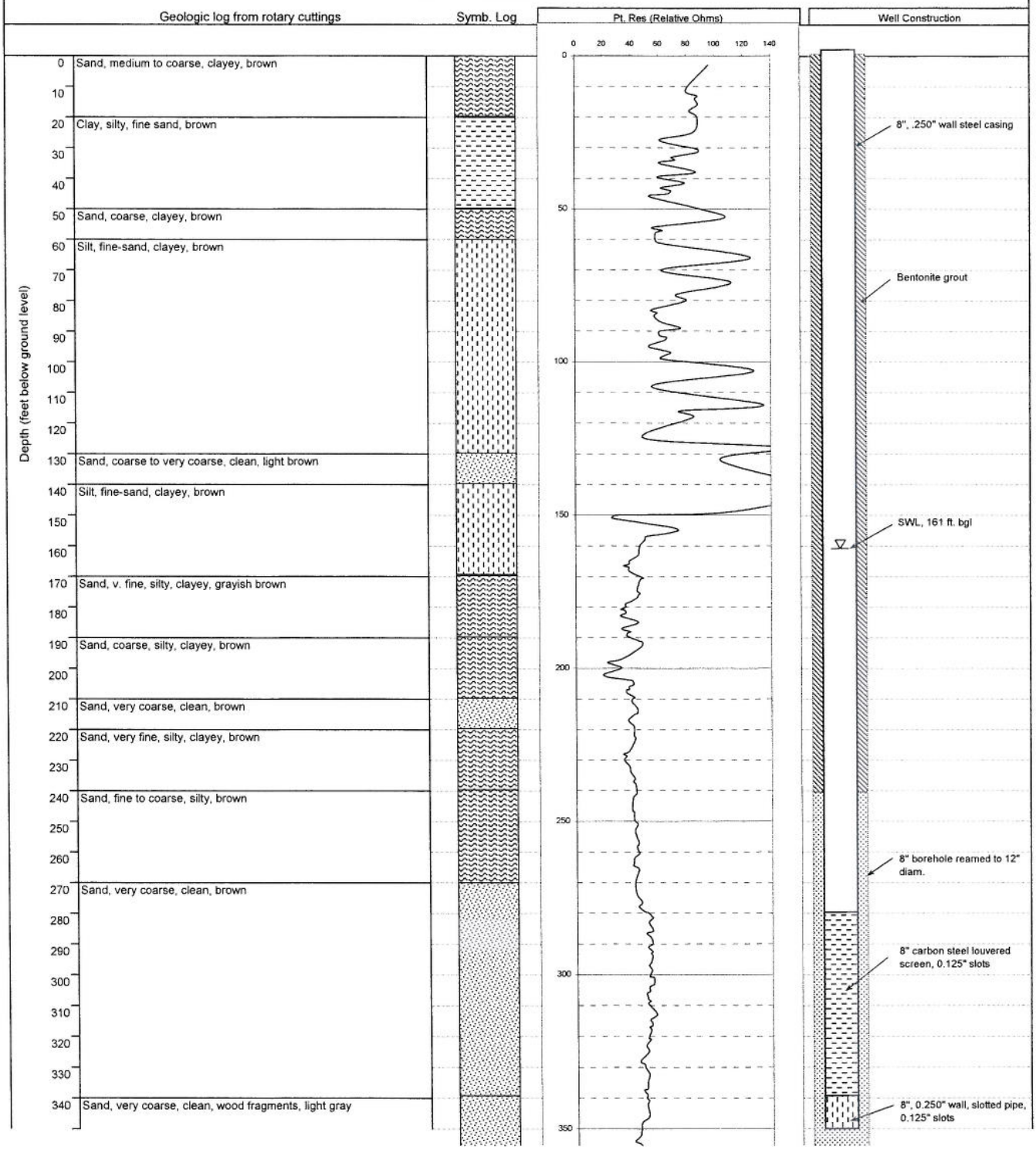
Company Name Adamson Pump & Drill Firm No. 457
Principal Driller Dave Adamson Date 4.15.04
and
Driller or Operator II Dave Adamson Date 4.15.04
Operator I ____ Date
Principal Driller and Rig Operator *Required*.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Exploration Hole SVR 7

Spring Valley Ranch

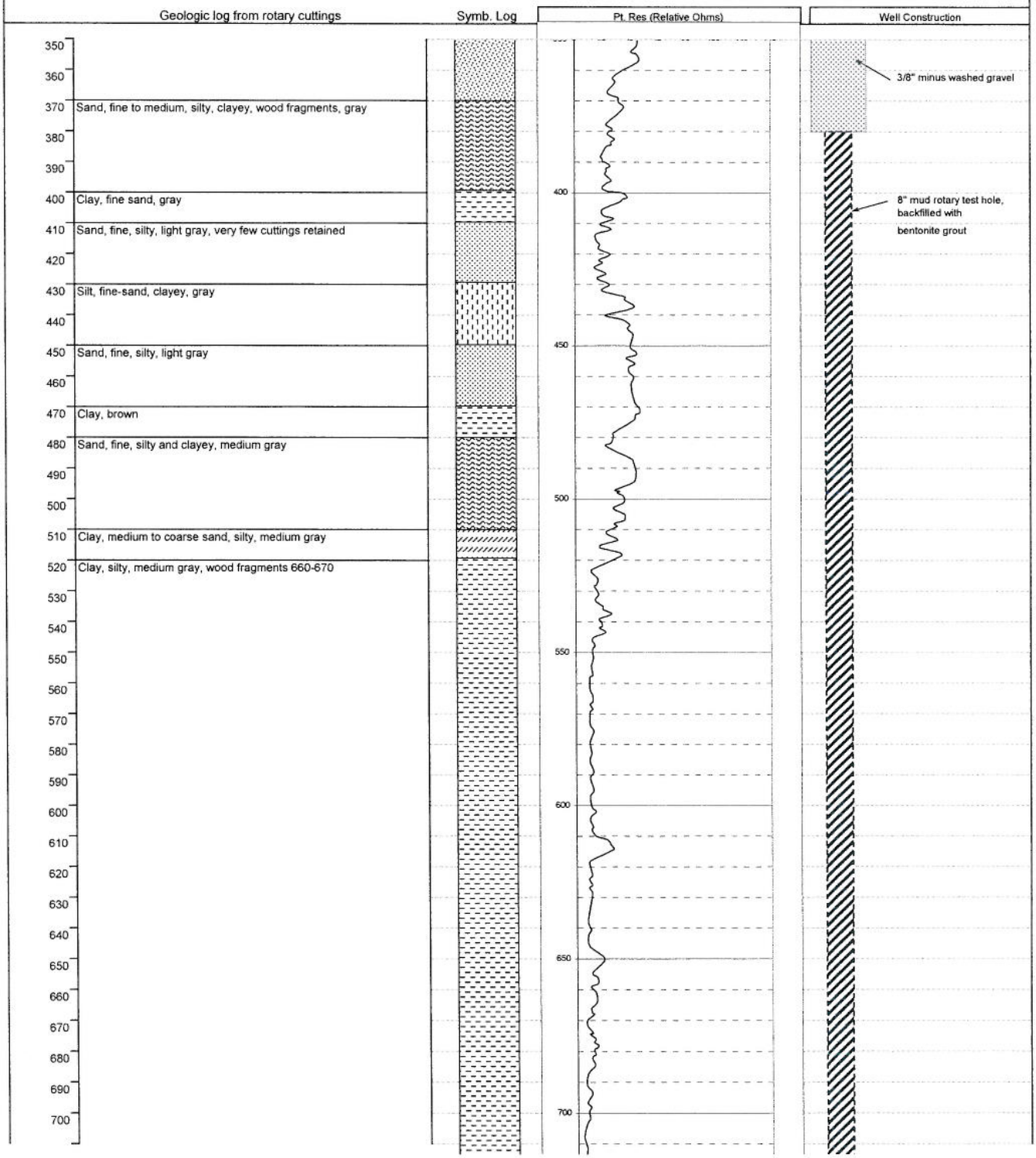
Drilled by: Adamson Pump and Drilling.	Drilled Dates: 3/18-4/10/04	Depth Drilled: 810 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, NE 1/4, SW 1/4, Sect 23
Geophysical logs by: Stevens and Sons Drilling	Borehole size: 8" (nom.)	Static WL: ~ 150 ft. bgl	GL Elevation: ~ 2700 ft. msl.
Fluid level when logged: +2 ft bgl	Borehole reamed to 12" for completion		
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - 810 ft.			



Exploration Hole SVR 7

Spring Valley Ranch

Drilled by: Adamson Pump and Drilling.	Drilled Dates: 3/18-4/10/04	Depth Drilled: 810 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, NE 1/4, SW 1/4, Sect 23
Geophysical logs by: Stevens and Sons Drilling	Borehole size: 8" (nom.)	Static WL: ~ 150 ft. bgl	GL Elevation: ~ 2700 ft. msl.
Fluid level when logged: +2 ft bgl	Borehole reamed to 12" for completion		
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - 810 ft.			



Exploration Hole SVR 7

Spring Valley Ranch

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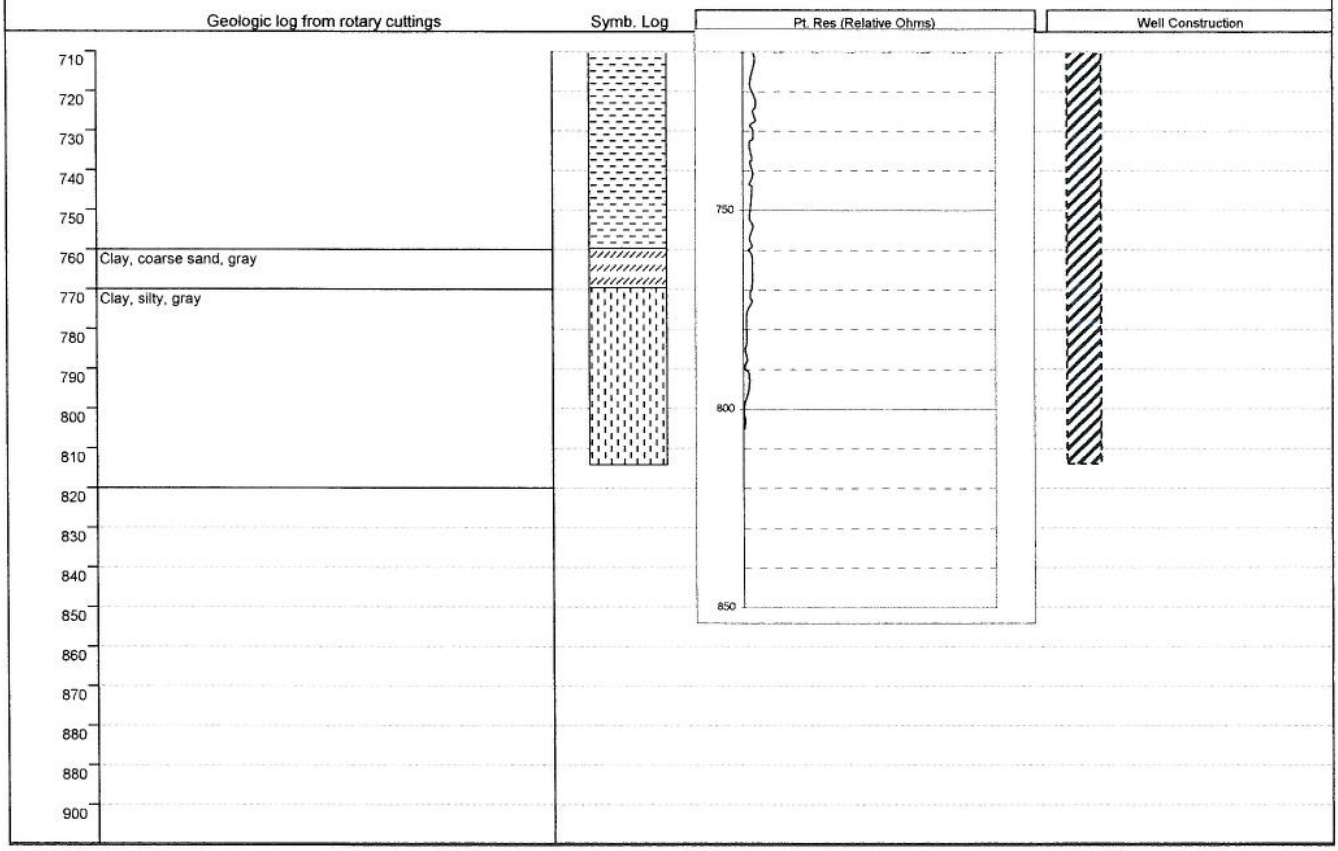


AQUIFER TEST DATA

Well No.: **Spring Valley Ranch, Test Well SVR 7** **Q=500 gpm, t = 22 hours 15 min.**

Test conducted by: Feast Geosciences; Adamson Pump and Drilling Co.

Flow measured by: In-line flow meter

Water levels measured by: Well sounder Water level measure point: Top of 1" PVC tube

MP Elevation: 3.0 ft agl Static WL (ft bmp): 163.71

Pump on: 04/21/04 11:00 Pump off: 04/22/04 9:44

				Water Level Data				
Date	Time	t (mins)	t/t'	Ref (ft.)	Measure (in.)	WL (ft bmp)	Drawdown (feet)	Comments
04/21/04	10:55	0		160.0	42.5	163.54		Static water level: Meter start 68950 cf
04/21/04	10:30	0		160.0	44.5	163.71	0.0	Start test, Q = 86 gpm
04/21/04	11:01	1		180	10	180.83	17.12	Q = 300 gpm
04/21/04	11:02	2		180	28	182.33	18.62	
04/21/04	11:03	3		180	31	182.58	18.87	
04/21/04	11:05	5		180	32	182.67	18.96	
04/21/04	11:06	6		180	33	182.75	19.04	
04/21/04	11:08	8		180	32	182.67	18.96	
04/21/04	11:09	9		180	31	182.58	18.87	
04/21/04	11:11	11		180	31	182.58	18.87	
04/21/04	11:13	13		180	31	182.58	18.87	
04/21/04	11:15	15		180	31.5	182.63	18.92	
04/21/04	11:17	17		180	30.5	182.54	18.83	
04/21/04	11:20	20		180	32.5	182.71	19.00	Clear, T 68.7°F
04/21/04	11:22	22		180	31.5	182.63	18.92	
04/21/04	11:25	25		180	29	182.42	18.71	Increase Q to 400 gpm
04/21/04	11:26	26		190	-9.5	189.21	25.50	
04/21/04	11:27	27		190	-8	189.33	25.62	
04/21/04	11:29	29		190	-9	189.25	25.54	
04/21/04	11:31	31		190	-9.5	189.21	25.50	
04/21/04	11:33	33		190	-12	189.00	25.29	
04/21/04	11:35	35		190	-11	189.08	25.37	
04/21/04	11:37	37		190	-12.5	188.96	25.25	
04/21/04	11:40	40		190	-12.5	188.96	25.25	
04/21/04	11:45	45		190	-14	188.83	25.12	
04/21/04	11:50	50		190	-12.5	188.96	25.25	
04/21/04	11:55	55		190	-13	188.92	25.21	Increase Q to max, ~500 gpm
04/21/04	11:56	56		195	-3.5	194.71	31.00	
04/21/04	11:57	57		195	-5	194.58	30.87	
04/21/04	12:00	60		195	-5	194.58	30.87	
04/21/04	12:05	65		195	-8	194.33	30.62	
04/21/04	12:10	70		195	-9	194.25	30.54	
04/21/04	12:18	78		195	-9	194.25	30.54	
04/21/04	12:25	85		195	-11	194.08	30.37	
04/21/04	12:30	90		195	-11	194.08	30.37	
04/21/04	12:43	103		195	-11	194.08	30.37	Sample @ 12:45
04/21/04	12:55	115		195	-12.5	193.96	30.25	T 68.1°F, pH=7.00, SC=300 µs
04/21/04	13:25	145		195	-14	193.83	30.12	
04/21/04	13:50	170		195	-13	193.92	30.21	
04/21/04	14:15	195		195	-15	193.75	30.04	
04/21/04	15:00	240		195	-15	193.75	30.04	
04/21/04	15:30	270		195	-16	193.67	29.96	
04/21/04	16:00	300		195	-17	193.58	29.87	
04/21/04	17:00	360		195	-17.125	193.57	29.86	
04/21/04	18:00	420		195	-16.75	193.60	29.89	
04/21/04	19:00	480		195	-17	193.58	29.87	
04/21/04	20:00	540		195	-17	193.58	29.87	
04/21/04	21:00	600		195	-18	193.50	29.79	
04/21/04	22:00	660		195	-16.5	193.63	29.92	
04/21/04	23:00	720		195	-18	193.50	29.79	
04/22/04	0:00	780		195	-17	193.58	29.87	
04/22/04	1:00	840		195	-18	193.50	29.79	
04/22/04	2:00	900		195	-18	193.50	29.79	
04/22/04	3:00	960		195	-18	193.50	29.79	
04/22/04	4:00	1020		195	-17	193.58	29.87	
04/22/04	5:00	1080		195	-17	193.58	29.87	
04/22/04	6:00	1140		195	-17	193.58	29.87	
04/22/04	7:00	1200		195	-17	193.58	29.87	
04/22/04	8:00	1260		195	-18	193.50	29.79	
04/22/04	9:11	1331		195	-16.75	193.60	29.89	
04/22/04	9:44	1364		195	-17	193.58	29.87	Meter end 15647 cf
Begin Recovery, pump off at:			04/22/04	9:44				
04/22/04	9:45	1365	1365.0	160	27	162.25	-1.46	
04/22/04	9:47	1367	455.7	165	2	165.17	1.46	
04/22/04	9:48	1368	342.0	165	1.5	165.13	1.41	
04/22/04	9:50	1370	228.3	165	-2	164.83	1.12	

AQUIFER TEST DATA

Well No.: **Spring Valley Ranch, Test Well SVR 7** **Q=500 gpm, t = 22 hours 15 min.**

Test conducted by: Feast Geosciences; Adamson Pump and Drilling Co.

Flow measured by: In-line flow meter

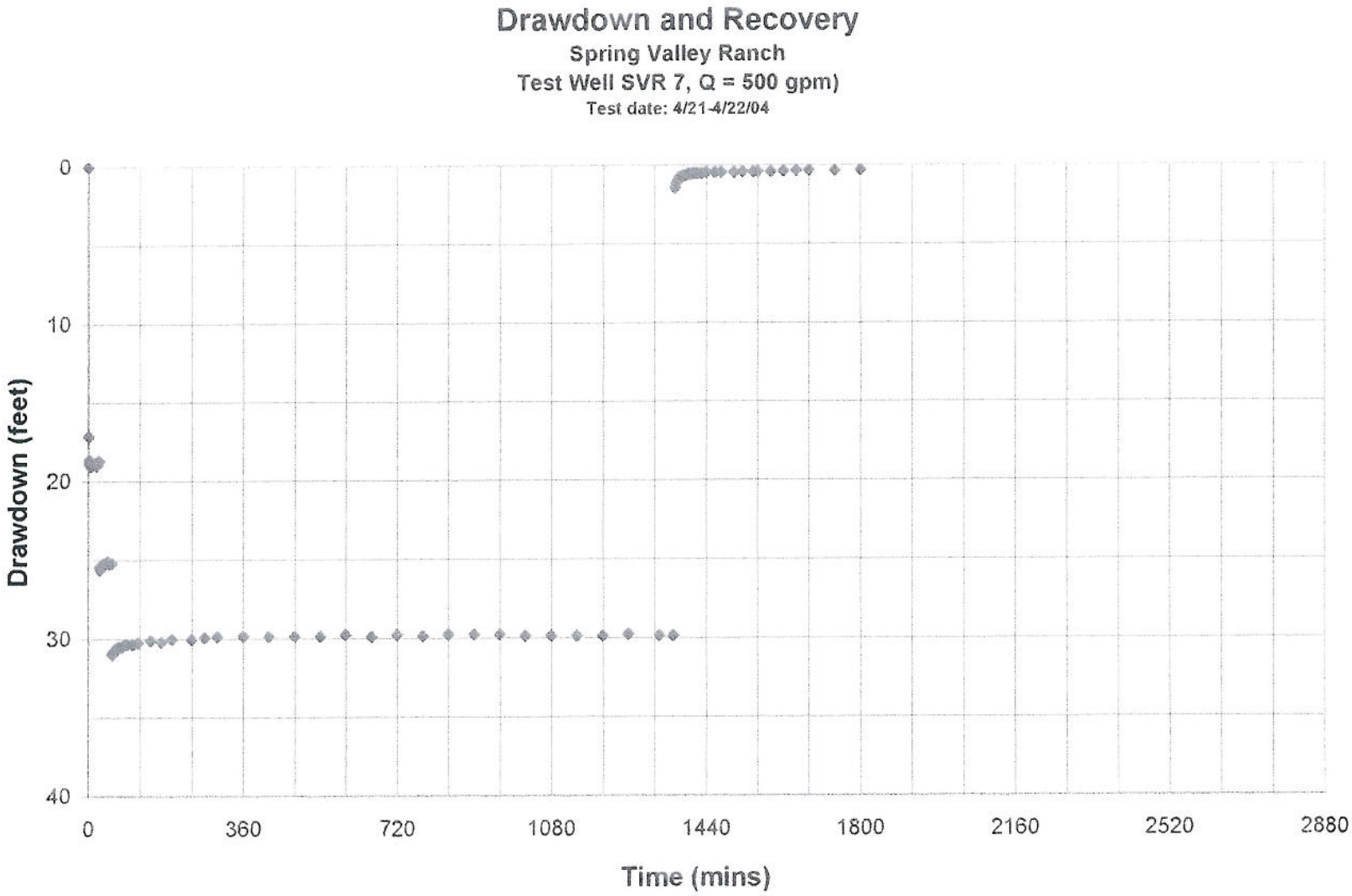
Water levels measured by: Well sounder Water level measure point: Top of 1" PVC tube

MP Elevation: 3.0 ft agl Static WL (ft bmp): 163.71

Pump on: 04/21/04 11:00 Pump off: 04/22/04 9:44

				Water Level Data				
Date	Time	t (mins)	t/t'	Ref (ft.)	Measure (in.)	WL (ft bmp)	Drawdown (feet)	Comments
04/22/04	9:52	1372	171.5	165	-3	164.75	1.04	
04/22/04	9:54	1374	137.4	165	-4	164.67	0.96	
04/22/04	9:55	1375	125.0	165	-4.5	164.63	0.91	
04/22/04	9:56	1376	114.7	165	-5	164.58	0.87	
04/22/04	9:58	1378	98.4	165	-6	164.50	0.79	
04/22/04	10:00	1380	86.3	165	-6.5	164.46	0.75	
04/22/04	10:02	1382	76.8	165	-6.75	164.44	0.73	
04/22/04	10:04	1384	69.2	165	-7	164.42	0.71	
04/22/04	10:06	1386	63.0	165	-7.25	164.40	0.69	
04/22/04	10:09	1389	55.6	165	-7.75	164.35	0.64	
04/22/04	10:12	1392	49.7	165	-8	164.33	0.62	
04/22/04	10:15	1395	45.0	165	-8.25	164.31	0.60	
04/22/04	10:19	1399	40.0	165	-8.75	164.27	0.56	
04/22/04	10:22	1402	36.9	165	-9	164.25	0.54	
04/22/04	10:25	1405	34.3	165	-9	164.25	0.54	
04/22/04	10:30	1410	30.7	165	-9.25	164.23	0.52	
04/22/04	10:35	1415	27.7	165	-9.25	164.23	0.52	
04/22/04	10:40	1420	25.4	165	-9.25	164.23	0.52	
04/22/04	10:50	1430	21.7	165	-9.5	164.21	0.50	
04/22/04	11:00	1440	18.9	165	-10	164.17	0.46	
04/22/04	11:20	1460	15.2	165	-10.25	164.15	0.44	
04/22/04	11:35	1475	13.3	165	-10.25	164.15	0.44	
04/22/04	12:05	1505	10.7	165	-10.25	164.15	0.44	
04/22/04	12:25	1525	9.5	165	-10.5	164.13	0.41	
04/22/04	12:50	1550	8.3	165	-10.5	164.13	0.41	
04/22/04	13:00	1560	8.0	165	-10.5	164.13	0.41	
04/22/04	13:30	1590	7.0	165	-10.75	164.10	0.39	
04/22/04	14:00	1620	6.3	165	-11	164.08	0.37	
04/23/04	14:30	1650	5.8	165	-11.25	164.06	0.35	
04/23/04	15:00	1680	5.3	165	-11.25	164.06	0.35	
04/23/04	16:00	1740	4.6	165	-11.5	164.04	0.33	
04/23/04	17:00	1800	4.1	165	-11.75	164.02	0.31	

Notes and Comments:
Pump at ~282 ft.

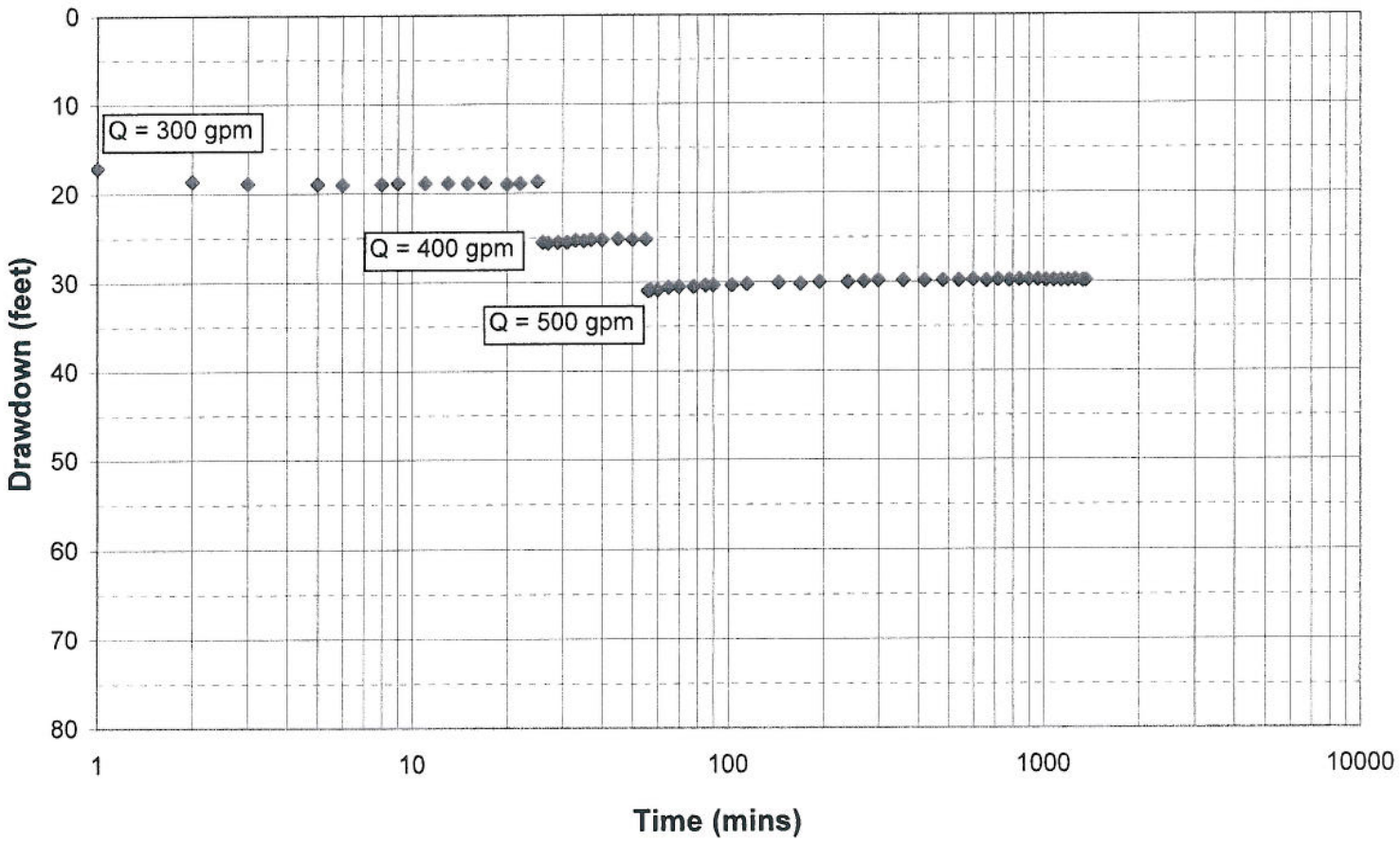

Drawdown and Recovery
Spring Valley Ranch
Test Well SVR 7, Q = 500 gpm)
Test date: 4/21-4/22/04
Drawdown (feet)
0
10
20
30
40
0
360
720
1080
1440
1800
2160
2520
2880
Time (mins)

Time - Drawdown

Spring Valley Ranch

Test Well SVR 7, Q = 500 gpm

Test date: 4/21-4/22/2004

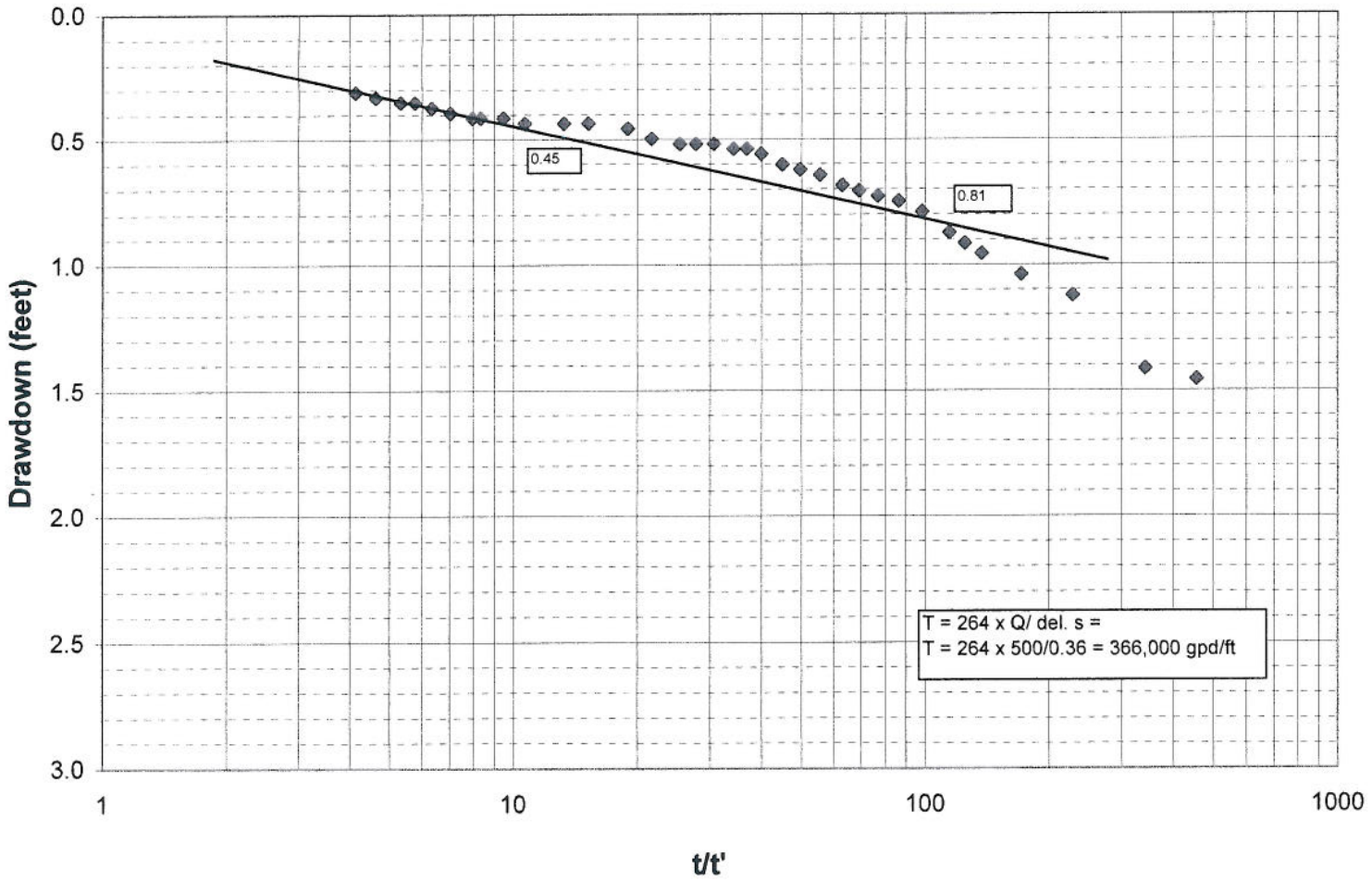


Time - Recovery

Spring Valley Ranch

Test Well SVR 7, Q = 500 gpm

Test date: 4/21-4/22/04



AQUIFER TEST DATA

Well No.: **Stock well, observation well for SVR 7** **Q=500 gpm, t = 22 hours 15 min.**

Test conducted by: Feast Geosciences; Adamson Pump and Drilling Co.

Flow measured by: Observation well, Radius = 845 ft

Water levels measured by: Well sounder Water level measure point: Top of 4" well seal

MP Elevation: 1.0 ft agl Static WL (ft bmp): 150.00

Pump on: 04/21/04 11:00 Pump off: 04/22/04 9:44

				Water Level Data				
Date	Time	t (mins)	t/t'	Ref (ft.)	Measure (in.)	WL (ft bmp)	Drawdown (feet)	Comments
04/21/04	13:05	0		150	1	150.08		Had to cut lock, missed first part of pumping period
04/21/04	13:10	0		150	0	150.00	0.0	
04/21/04	13:15	135		150	0	150.00	0.00	
04/21/04	13:20	140		150	0	150.00	0.00	
04/21/04	13:30	150		150	0	150.00	0.00	
04/21/04	13:45	165		150	0	150.00	0.00	
04/21/04	14:00	180		150	1	150.08	0.08	
04/21/04	14:30	210		150	1	150.08	0.08	
04/21/04	15:00	240		150	1.5	150.13	0.13	
04/21/04	15:40	280		150	1.5	150.13	0.13	
04/21/04	16:00	300		150	1.5	150.13	0.13	
04/21/04	18:00	420		150	2	150.17	0.17	
04/21/04	20:00	540		150	2	150.17	0.17	
04/21/04	22:00	660		150	3	150.25	0.25	
04/22/04	0:00	780		150	4	150.33	0.33	
04/22/04	2:00	900		150	5.25	150.44	0.44	
04/22/04	4:00	1020		150	5.5	150.46	0.46	
04/22/04	6:00	1140		150	6	150.50	0.50	
04/22/04	9:20	1340		150	6.5	150.54	0.54	
Begin Recovery, pump off at:			04/22/04	9:44				
04/22/04	9:57	1377	37.2	150	6.5	150.54	0.54	
04/22/04	10:04	1384	31.5	150	6	150.50	0.50	
04/22/04	10:14	1394	25.8	150	5.5	150.46	0.46	
04/22/04	10:24	1404	21.9	150	5	150.42	0.42	
04/22/04	10:55	1435	15.1	150	4.25	150.35	0.35	
04/22/04	11:30	1470	11.3	150	3.5	150.29	0.29	
04/22/04	11:55	1495	9.6	150	3.25	150.27	0.27	
04/22/04	12:25	1525	8.2	150	3	150.25	0.25	
04/22/04	12:55	1555	7.2	150	2.75	150.23	0.23	
04/22/04	13:35	1595	6.3	150	2.5	150.21	0.21	
04/22/04	14:10	1630	5.6	150	2.25	150.19	0.19	
04/22/04	14:35	1655	5.3	150	2	150.17	0.17	
04/22/04	15:05	1685	4.9	150	1.75	150.15	0.15	
04/22/04	16:10	1750	4.3	150	1.5	150.13	0.13	
04/22/04	17:05	1805	3.9	150	1.25	150.10	0.10	

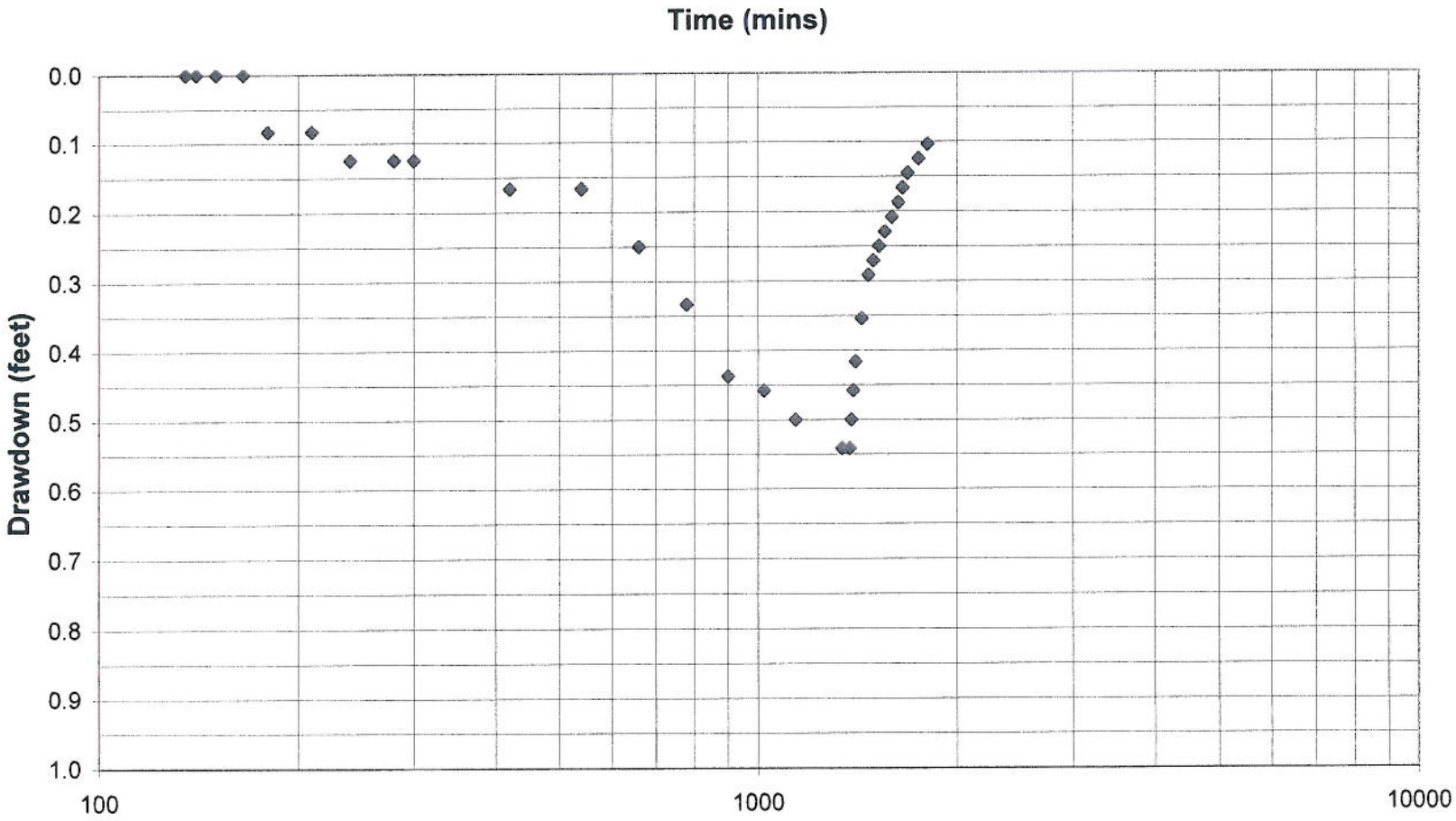
Notes and Comments:
Pump at ~282 ft.
SWL ~ +2 ft gl.

Drawdown and Recovery

Spring Valley Ranch

Obs. Well for SVR 7, Q = 500 gpm)

Test date: 4/21-4/22/04

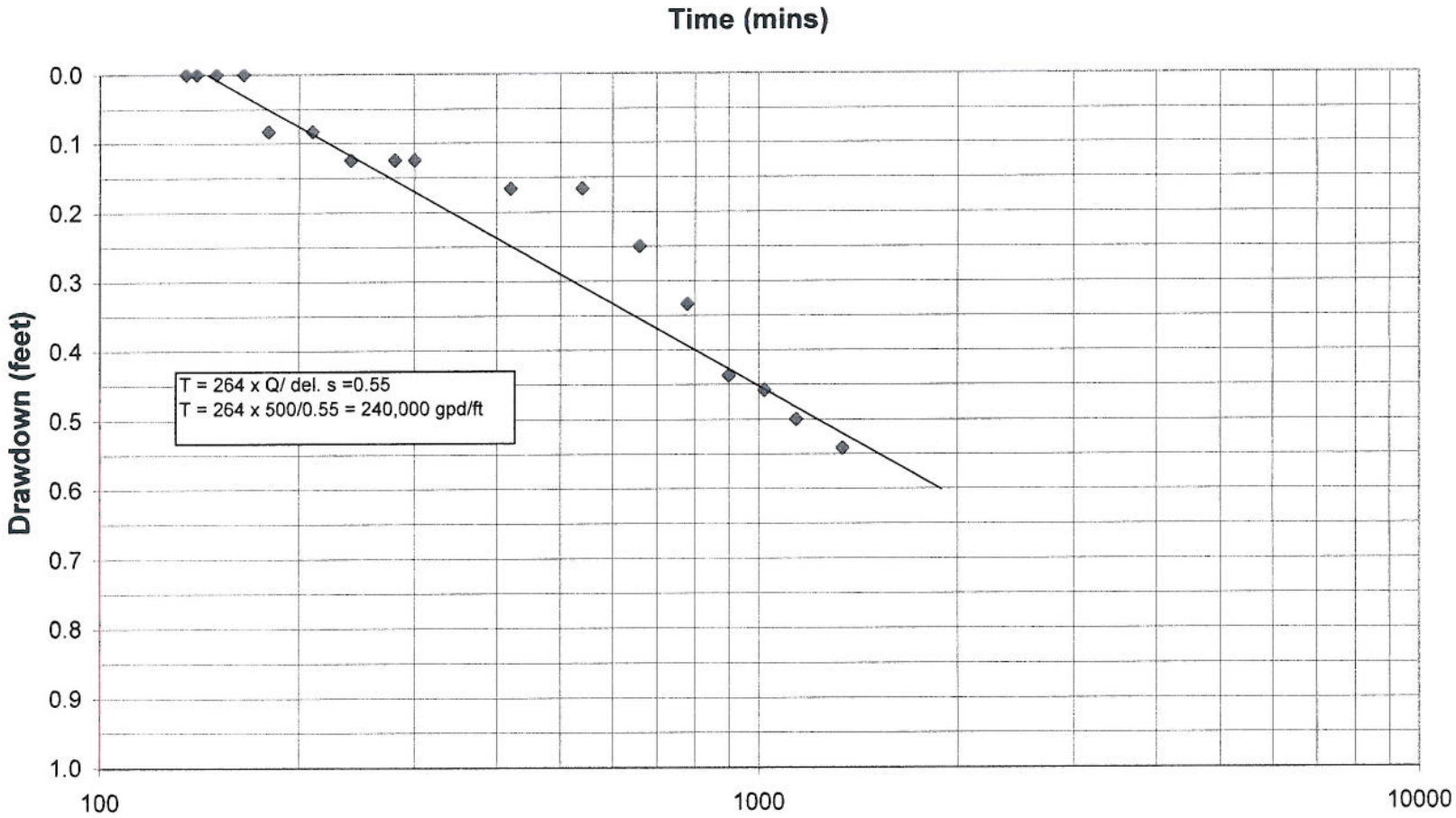


Drawdown

Spring Valley Ranch

Obs. Well for SVR 7, Q = 500 gpm

Test date: 4/21-4/22/04

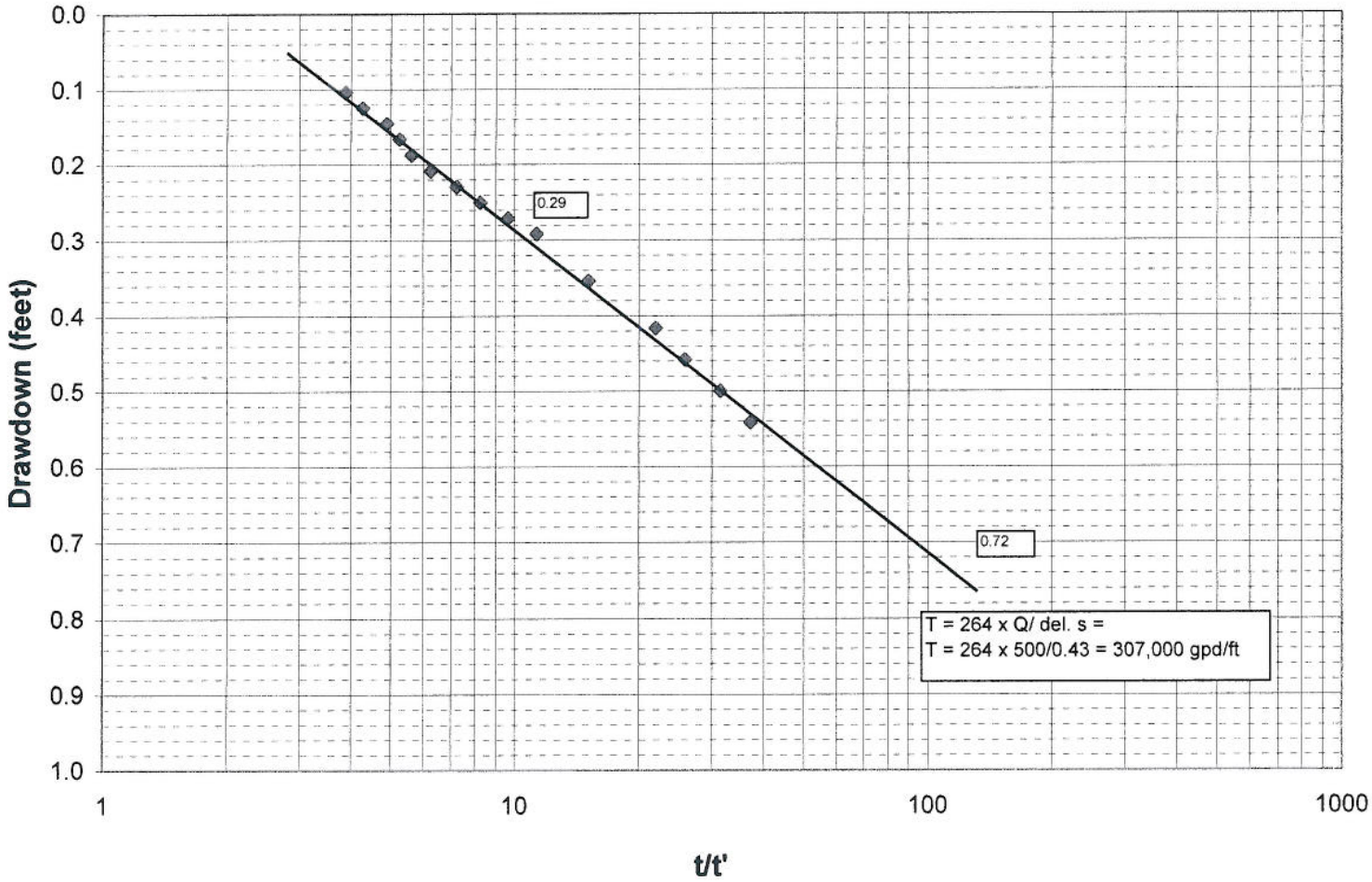


Time - Recovery

Spring Valley Ranch

Obs. Well for SVR 7, Q = 500 gpm

Test date: 4/21-4/22/04



Laboratory Analysis Report

Sample Number: 0412351

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Nitrate (as N)	10	0.31	mg/L	0.20	EPA 300.0	4/22/2004	WW
Nitrite (as N)	1.00	<0.01	mg/L	0.01	EPA 353.2	4/22/2004	WW
Bicarbonate		114	mg/L		SM 2320	4/28/2004	ARR
Chloride, Cl	UR	5	mg/L	1	EPA 300.0	4/22/2004	WW
Fluoride, F	4.0	0.44	mg/L	0.10	EPA 300.0	4/27/2004	WW
Sulfate, SO4	UR	24	mg/L	1	EPA 300.0	4/22/2004	WW
Hardness	UR	110	mg/L	5.0	SM 2340	4/28/2004	ARR
Sulfide, Dissolved (as H2S)		<0.05	mg/L	0.05	SM 4500-S2 D	4/22/2004	RG
Total Dissolved Solids	UR	212	mg/L	25	EPA 160.1	4/24/2004	DLR

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Michael D. Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,

please contact: **Michael Moore**

LAB FEDERAL ID#: **ID00020**	LAB SAMPLE #: **0412351**
DATE LAB REC'D SAMPLE: 4/22/2004	DATE REPORTED BY LAB: 5/25/2004
COMPLIANCE SAMPLE ☐ YES ☐ NO	REPLACEMENT SAMPLE ☐
COLLECTION DATE: 4/21/2004	COLLECTION TIME: (24 hour clock) 12:45
SAMPLE TYPE: ☐ CO-confirmation ☐ RP-repeat ☐ RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other	
PWS#:	PWS NAME: S P F WATER ENGINEERING, LLC
SAMPLING POINT/LOCATION: SPRING VALLEY RANCH #7	TAG #/FACILITY ID:
COLLECTOR'S NAME: C FEAST	CONTACT PHONE # (208) 383-4140

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

http://www.analyticallaboratories.com

PUBLIC DRINKING WATER SYSTEM INORGANIC CHEMICAL (IOC) ANALYSIS REPORT:

Phase II							
FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst
1010	Barium	ND	EPA 200.7	2	0.05	4/27/2004	JH
1015	Cadmium	ND	SM 3113 B	0.005	0.0005	5/22/2004	DMB
1020	Chromium	ND	SM 3113 B	0.1	0.002	5/6/2004	DMB
1035	Mercury	ND	EPA 245.1	0.002	0.0002	4/29/2004	SS
1038	Ttl(N02/N03)	---		10			
1040	Nitrate	0.31	EPA 300.0	10	0.2	4/22/2004	WW
1041	Nitrite	ND	EPA 353.2	1.0	0.01	4/22/2004	WW
1045	Selenium	---		0.05			
1024	Cyanide	---		0.2			
Secondary IOCs (optional)							
1050	Silver	---		0.1			
1049	Silica, As SiO2	---					
1042	Potassium	2.0	EPA 200.7		0.5	4/23/2004	JH
1032	Manganese	ND	EPA 200.7	0.05	0.05	4/26/2004	JH
1031	Magnesium	8.19	EPA 200.7		0.1	4/23/2004	JH
1028	Iron	0.11	EPA 200.7	0.3	0.05	4/26/2004	JH
1027	Hydrogen Sulfide	ND	SM 4500-S		0.05	4/22/2004	RG
1022	Copper	---		1.0			
1017	Chloride	5	EPA 300.0	250	1	4/22/2004	WW
1016	Calcium	29.1	EPA 200.7		0.1	4/23/2004	JH
1003	Ammonia as N	ND	EPA 350.1		0.04	4/28/2004	WW
1002	Aluminum	---		0.05-			

Phase V							
FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst
1085	Thallium	ND	SM 3113 B	0.002	0.002	5/10/2004	DMB
1075	Beryllium	ND	SM 3113 B	0.004	0.0005	5/10/2004	DMB
1074	Antimony	ND	SM 3113 B	0.006	0.005	5/13/2004	DMB
1036	Nickel	ND	EPA 200.7	n/a	0.02	4/26/2004	JH
Other IOCs							
1052	Sodium	22.9	EPA 200.7	n/a	0.1	4/23/2004	JH
1025	Fluoride	0.44	EPA 300.0	4.0	0.1	4/27/2004	WW
1005	Arsenic	ND	SM 3113 B	0.05	0.005	4/29/2004	JH
2905	Surfactants	---					
1997	Langlier Index	---					
1930	Dissolved Solids	212	EPA 160.1	500	25	4/24/2004	DLR
1927	Alkalinity as CaC03	---					
1926	Conductivity uS/cm	---					
1925	pH	---		6.5-8.			
1920	Odor (Threshold #)	---		3			
1915	Hardness as CaC03	110	SM 2340		5	4/28/2004	ARR
1905	Color	---		15c.u.			
1095	Zinc	---		5			
1055	Sulfate	24	EPA 300.0	250	1	4/22/2004	WW

TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

*Reported in mg/L unless otherwise noted
ND = Not detected within sensitivity of instrument
--- = No analysis performed
MDL = Method detection limit

Michael N. Meece
Signature of Laboratory Supervisor

5/27/04
Date

Well #7E

Printed 03/15/2004
Drilling Permit No. 811501
Well Tag No. D0031062
Well ID # 382205
Water Right No.
Receipt # W031368
Approved Date March 15, 2004

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
DRILLING PERMIT

Relationship: Applicant
Name: SPRING VALLEY DEVELOPMENT LLC
Address: 485 EAST RIVERSIDE DR
EAGLE ID 83616

Phone: (208) 939-0343

Proposed Well Location: Township 05N, Range 01W, Section 23, NE, SW
COUNTY ADA Sub Name WELL #7

Street Address of Well Site: BIG GULCH SW OF WILLOW CREEK RD
EAGLE ID

Proposed Use of Well: Test

Well Construction Information:

A. New Well
B. Proposed Surface Diameter: 8 Inches. Proposed Depth 800 Feet.
C. Anticipated Bottom Hole Temperature: 85F and less

Construction Start Date: Mar 12 2004

Anticipated Well Drilling Company: ADAMSON PUMP & DRILLING (No. 457)

Applicant's Signature: ___See original application_____ Date _____

Title: _____

Well Tag No. D0031062

ACTION OF THE DEPARTMENT OF WATER RESOURCES

This permit is Approved on Monday, March 15, 2004.

1. This drilling permit is valid for two (2) months from the approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the local Health District or the Idaho Department of Environmental Quality which may be required prior to construction of this well. The local Health District should be contacted for septic tank/drainfield locations. Domestic wells must not be drilled closer than 100 ft. from any drainfield and 50 ft. from any septic tank. Public Water Supply wells must not be drilled closer than 100 ft. from any drainfield or septic tank.
3. The well shall be constructed by a driller currently licensed in the state of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals that may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho. If the well being drilled is associated with approved water rights(s) use of the well must comply with conditions of said water right(s).
7. If a bottom hole temperature of 85 Degrees F (29.44 oC) or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department of Water Resources immediately.
8. Idaho Code, S 55-2201 - 55-2210 requires the applicant and/or its contractors to contact "Dig-line" (Dig-Line is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "Dig-Line " Number for this location is 1-800-342-1585
9. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.
10. This drilling permit has been approved for construction or drilling of an exploratory well intended to be used for collecting geologic, hydrologic or water quality data.
11. No water shall be produced from this well or any fluid injected into this well without specific written authorization from the Department.
12. Any surface casing installed in this well shall not exceed 8 inches nominal diameter.
13. All casing strings installed in this well shall be sealed their entire length with approved seal material and by positive means of placement unless otherwise authorized by this drilling permit.
14. A drilling prospectus including a schematic diagram and construction narrative describing all pertinent features of the well including drilling methods, seal material and placement methods, casing schedules and specifications shall be submitted for review by the department and attached to this drilling permit prior to the start of construction.
15. No casing installed in this well shall be drilled and driven through multiple aquifers, unless it is completely removed and the borehole is properly sealed or the casing is perforated at appropriate intervals and pressure grouted with approved grout. Drilling and driving casing may be allowed above the water table or where multiple aquifers are not encountered provided that the casing is sealed as required by administrative rules.

16. This well shall be properly plugged in accordance with a plan approved by the department at least 30 days prior to the expiration of the bond.
17. The bond secured for abandonment of this well shall be valid for the entire time the well remains open. The Department will give the well owner 60 days notice prior to the expiration of the bond that the well must be properly plugged. If the well owner has not properly plugged the well at least 30 days prior to the expiration of the bond, the Director may commence action to attach the bond and hire a licensed driller to properly plug the well.
18. Drilling of this well shall not commence until the Department has received a document from the surety company or bank stating that the bond is in full force and effect and the Department has determined the amount of the bond is sufficient.
19. This drilling permit is not valid unless the well owner has secured a bond in favor of the Director in an amount sufficient for proper plugging and abandonment of this well. The bond shall remain in effect and accessible by the Director until this well is plugged. The bond amount for this well shall be at least $5,600.

Signature of Authorized Dept Representative

Sr WR Agent
Title

Appendix C
Supplementary Data
Spring Valley Ranch Exploration Well SVR 9

Form 238-7
6.02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No.
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0031492
DRILLING PERMIT NO. 815596
Water Right or Injection Well No. 386274

2. OWNER:
Name SUNCOR
Address 485 E Riverside Dr. #300
City Eagle State ID Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North XX or South ☐
Rge. 1 East XX or West ☐
Sec. 9 ~~10 acres~~ 1/4 ~~S/W 40 acres~~ 1/4 ~~W/E 160 acres~~ 1/4
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site ½ mile SW of Willow Creek Rd City Eagle
(Give at least one road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Therma ☐ Injection XX Other test #9

5. TYPE OF WORK check all that apply (Replacement etc.)
XX New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable XX Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
bentanite grout	806	265	1250 gal	pumped
bentanite grout	215	0	300 gal	pumped

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) ____
Was drive shoe seal tested? ☐ Y ☐ N How? ____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	235	250	steel	XX	☐	XX	☐
6"	245	253	250	steel	XX	☐	XX	☐
					☐	☐	☐	☐

Length of Headpipe +2 Length of Tailpipe 0
Packer ☐ Y ☐ N Type ____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method ____
Screen Type & Method of Installation stainless

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
235	245	30		6"	stnls	XX	☐
253	263	30		6"	stnls	XX	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
#8-12 sand			3000#	

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
193' 4" ft. below ground Artesian pressure ____ lb.
Depth flow encountered 198 ft. Describe access port or control devices: ____

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian XX

Yield gal./min.	Drawdown	Pumping Level	Time
43	14'	207	4½ hr

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	10	topsoil, sandy clay		X
	10	27	sand, brown clay		X
	27	60	tan gray clay		X
	60	90	sandy brown clay w/ gray streaks		X
	90	104	gray clay		X
	104	110	sandy brown clay		X
	110	155	coarse sand w/ gray streaks		X
	155	198	coarse to medium sand w/ clay streaks	X	
				X	
	198	210	reddish sand	X	
	210	243	fine sand w/ clay streaks	X	
	243	265	sand w/ wood, clay streaks		X
	265	430	silty gray blue clay		X
	430	530	sticky gray blue clay		X
	530	531	hard shale		X
	531	780	gray blue clay		X
	780	781	hard shale		X
	781	806	gray blue clay		
			topped with chips 20 sks		

Completed Depth 806 drilled, 263 cased (Measurat
Date: Started 6/ /04 Completed 6/25/04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at th
time the rig was removed.

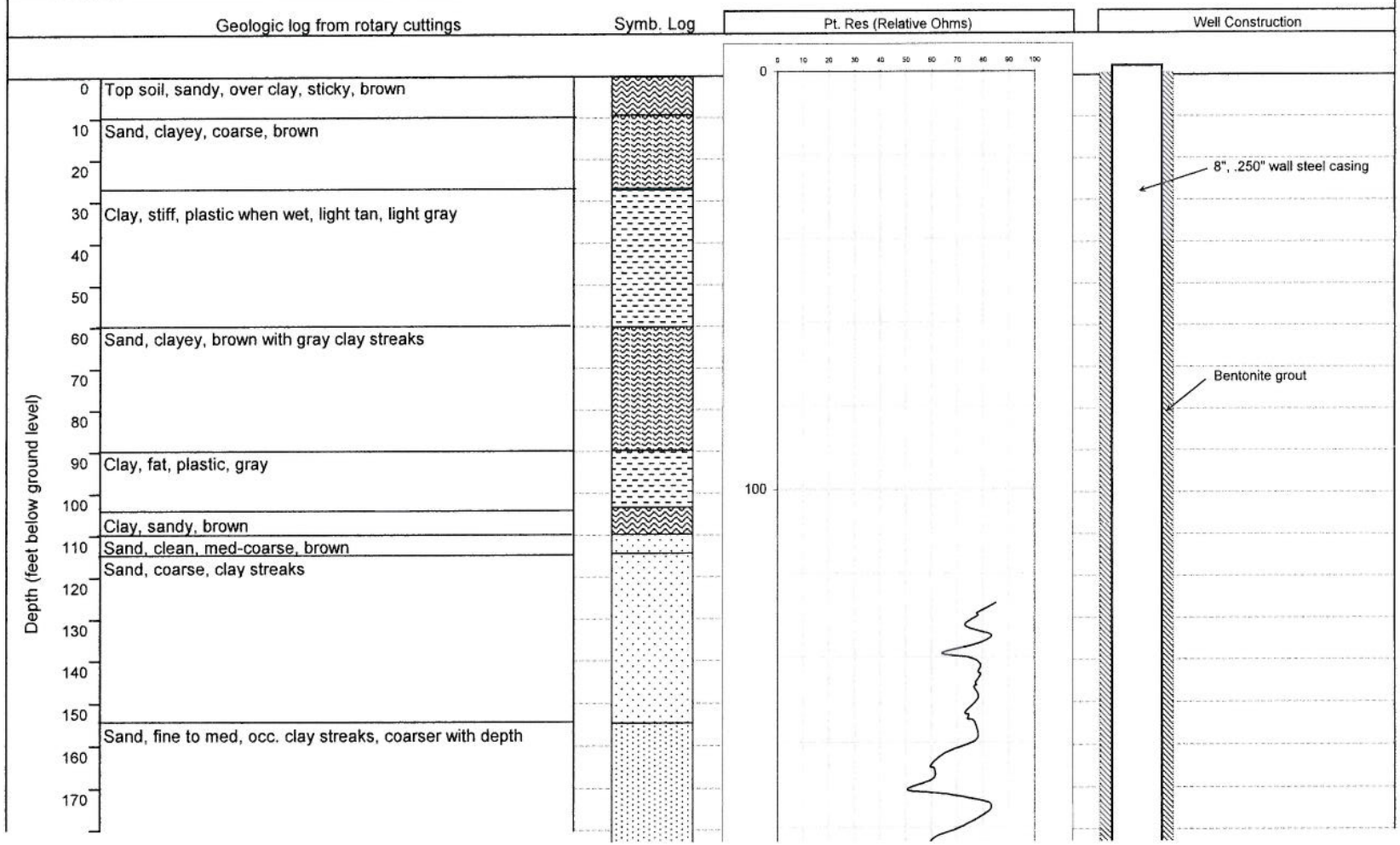
Company Name Stevens & Sons Firm No. 15
Principal Driller ____ Date 6/28/
and
Driller or Operator II ____ Date ____
Operator I ____ Date ____
Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

WHITE COPY TO WATER RESOURCES

Exploration Hole SVR 9

Spring Valley Ranch

Drilled by: Stevens and Son	Drilled Dates: 5/3-	Depth Drilled: 810 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, 1/4, 1/4, Sect 9
Geophysical logs by: Stevens and Sons Drilling	Borehole size: 8" (nom.)	Static WL: ~ 193 ft. bgl	GL Elevation: ~ 2700 ft. msl.
Fluid level when logged:	Borehole reamed to 12" for		
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - ft.	completion		



Exploration Hole SVR 9

Spring Valley Ranch

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Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, 1/4, 1/4, Sect 9
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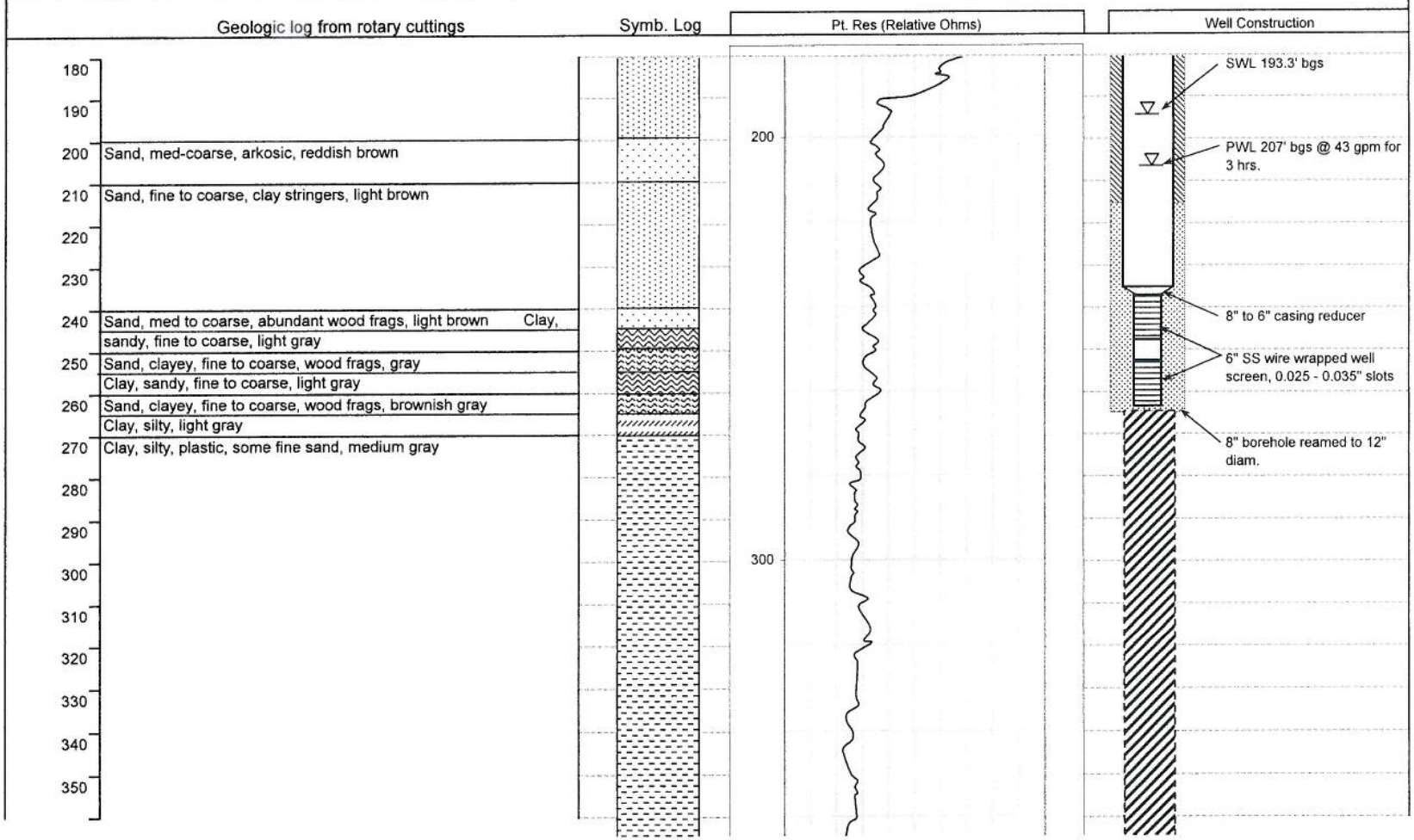
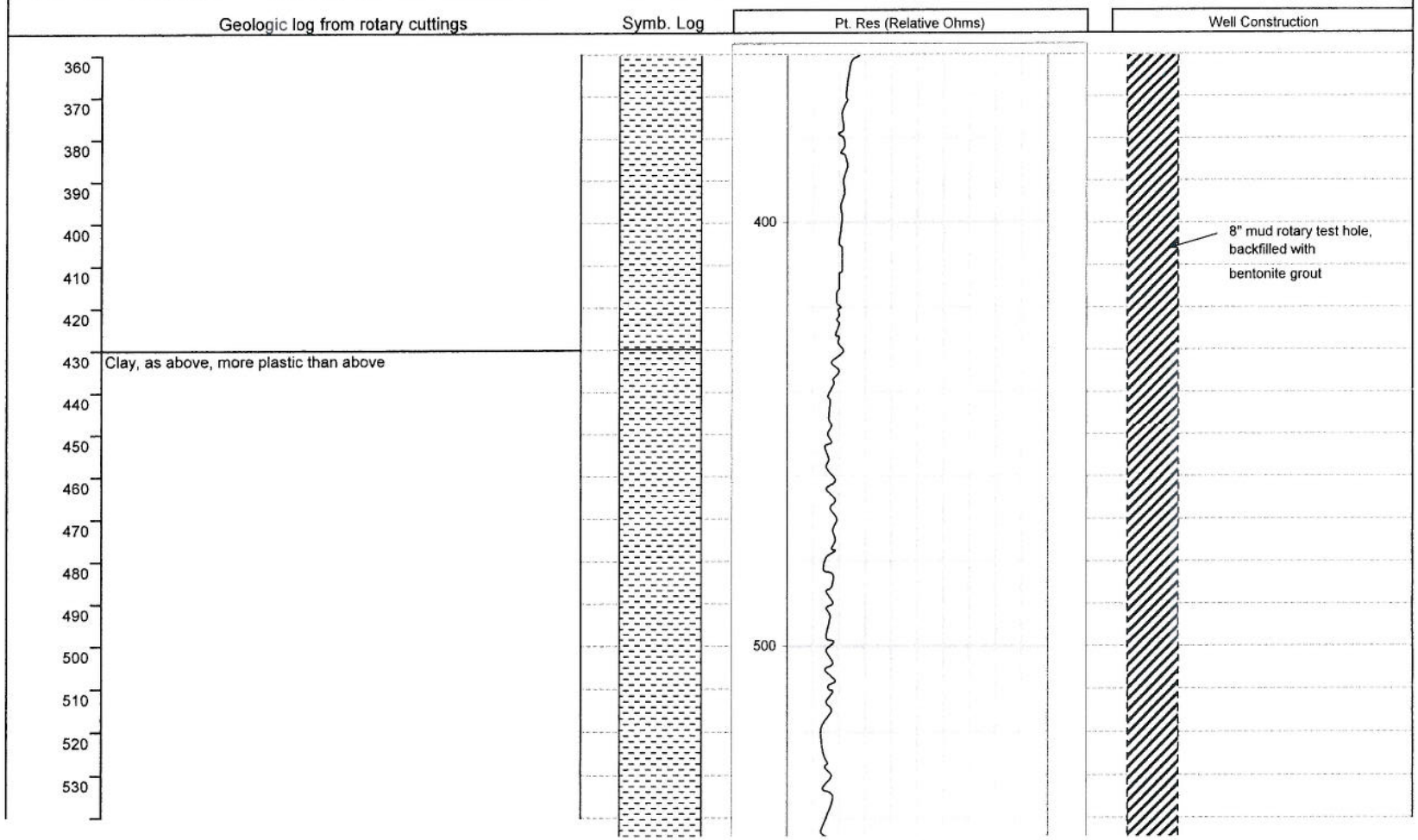
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - ft.	completion		



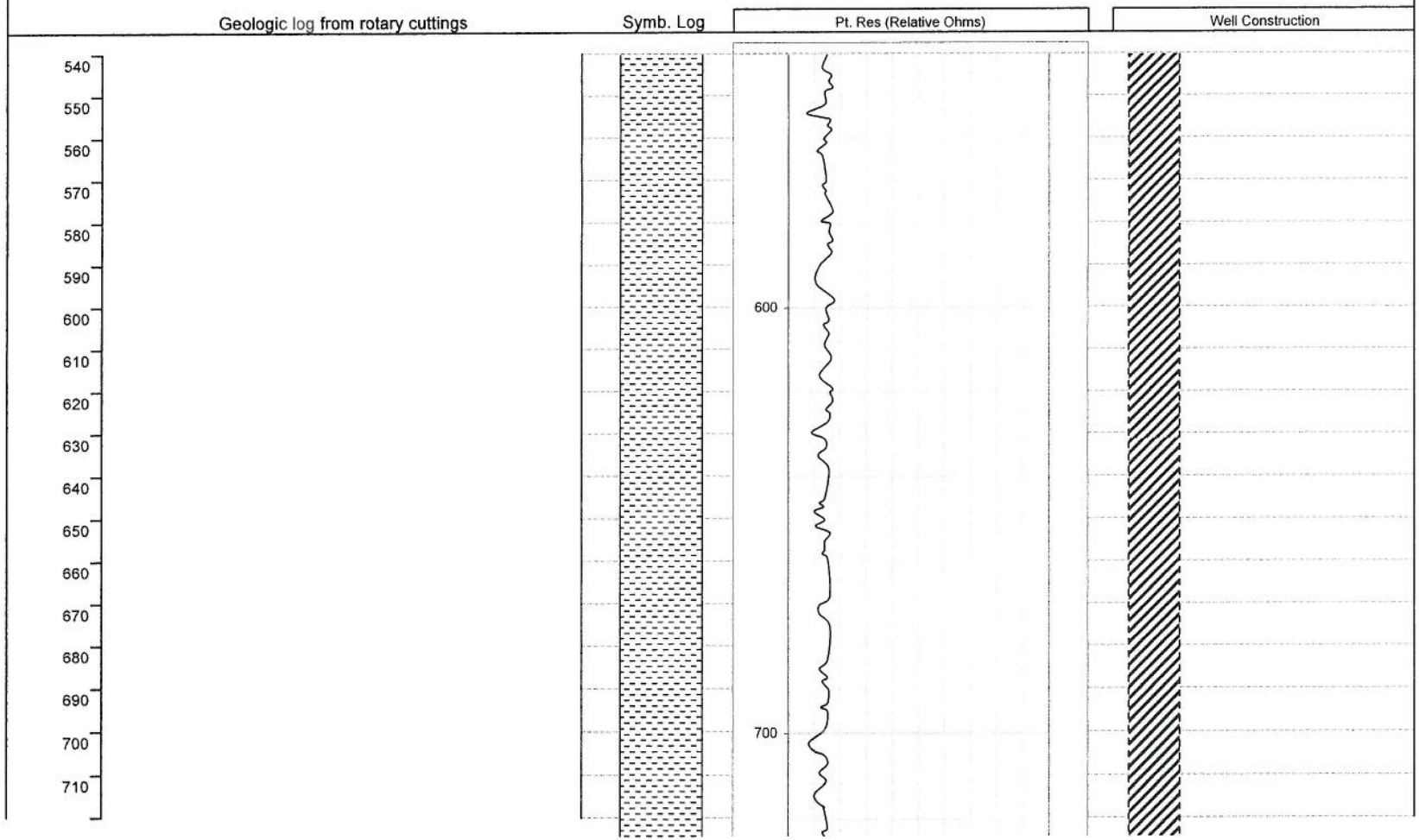
Exploration Hole SVR 9
Spring Valley Ranch

Drilled by: Stevens and Son	Drilled Dates: 5/3-	Depth Drilled: 810 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, 1/4, 1/4, Sect 9
Geophysical logs by: Stevens and Sons Drilling	Borehole size: 8" (nom.)	Static WL: ~ 193 ft. bgl	GL Elevation: ~ 2700 ft. msl.
Fluid level when logged:	Borehole reamed to 12" for		
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - ft.	completion		



Exploration Hole SVR 9
Spring Valley Ranch

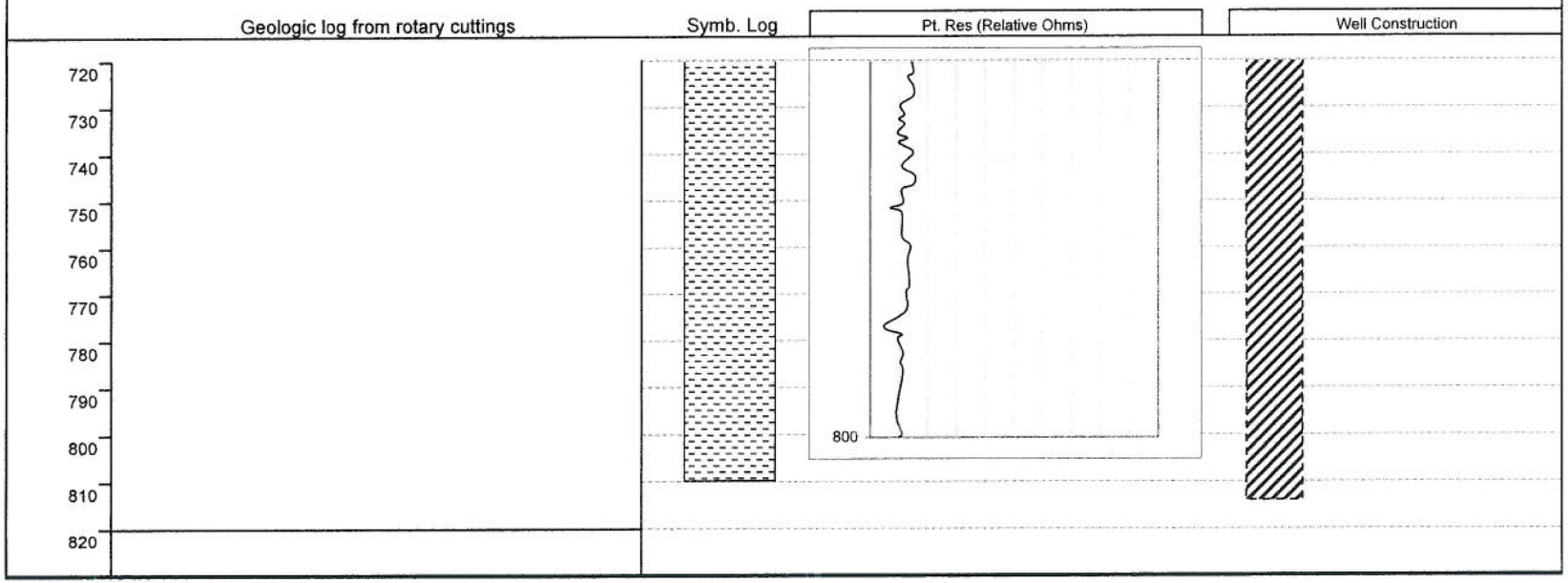
Drilled by: Stevens and Son	Drilled Dates: 5/3-	Depth Drilled: 810 ft	Location: Ada County, Idaho
Logged by: C. Feast/Feast Geosciences, LLC	Drilling Method: Mud Rotary	Depth Logged: 805 ft.	T5N, R1W, 1/4, 1/4, Sect 9
Geophysical logs by: Stevens and Sons Drilling	Borehole size: 8" (nom.)	Static WL: ~ 193 ft. bgl	GL Elevation: ~ 2700 ft. msl.
Fluid level when logged:	Borehole reamed to 12" for completion		
Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - ft.			



Exploration Hole SVR 9

Spring Valley Ranch

Drilled by: Stevens and Son Logged by: C. Feast/Feast Geosciences, LLC Geophysical logs by: Stevens and Sons Drilling Fluid level when logged: Casing when logged: 8" steel 0-5 ft, 8" open hole 5 - ft.	Drilled Dates: 5/3- Drilling Method: Mud Rotary Borehole size: 8" (nom.) Borehole reamed to 12" for completion	Depth Drilled: 810 ft Depth Logged: 805 ft. Static WL: ~ 193 ft. bgl	Location: Ada County, Idaho T5N, R1W, 1/4, 1/4, Sect 9 GL Elevation: ~ 2700 ft. msl.



AQUIFER TEST DATA

Well No.: **Spring Valley Ranch, Test Well SVR 9** **Q=43 gpm, t = 3 hours**

Test conducted by: Feast Geosciences; Stevens and Son Drilling Co.

Flow measured by: Bucket and watch

Water levels measured by: Well sounder Water level measure point: Top of 1" poly tube

MP Elevation: 4.0 ft agl Static WL (ft bmp): 197.33

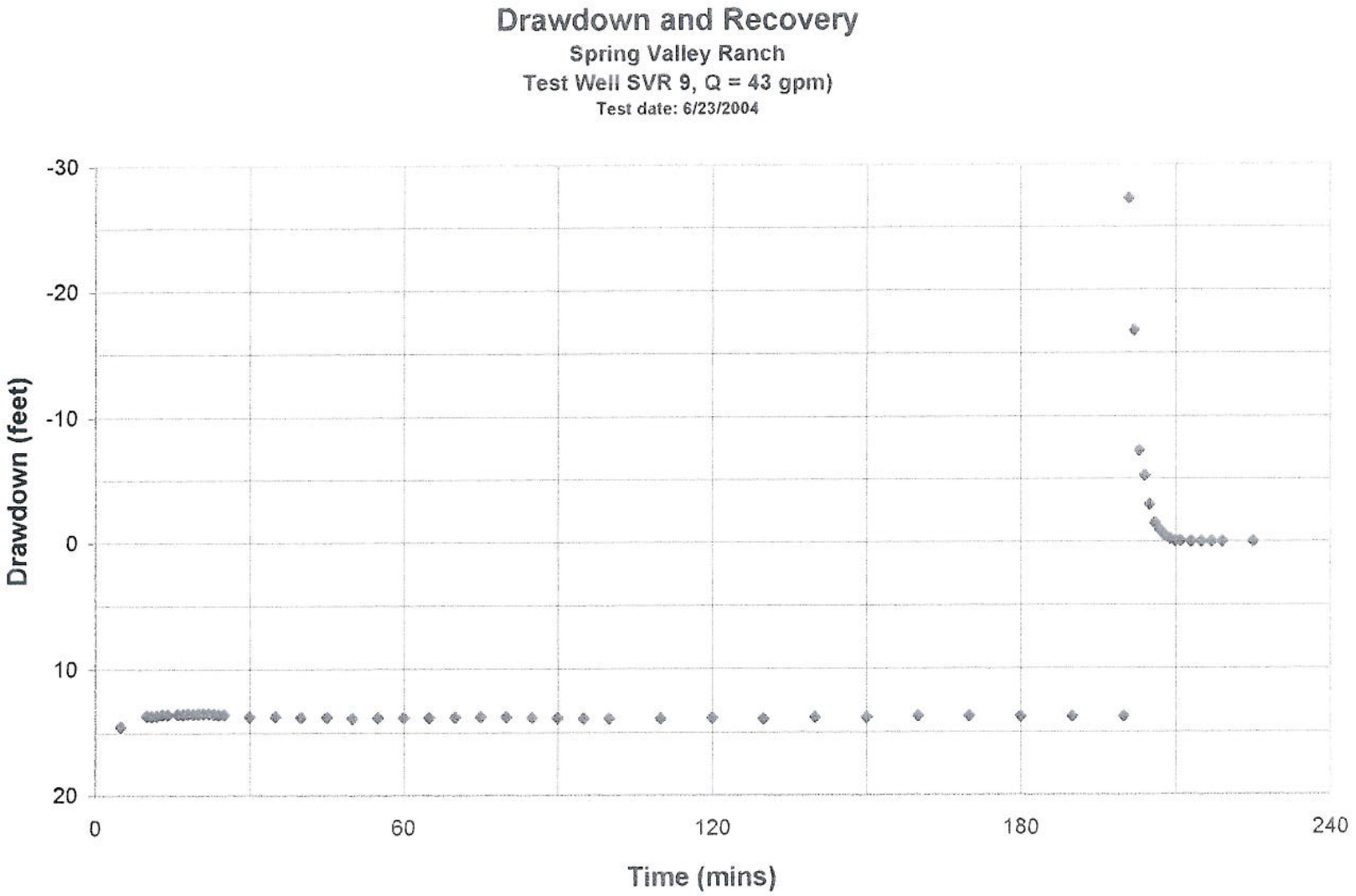
Pump on: 06/23/04 9:20 Pump off: 06/23/04 12:40

				Water Level Data				
Date	Time	t (mins)	t/t'	Ref (ft.)	Measure (in.)	WL (ft bmp)	Drawdown (feet)	Comments
02/04/04	9:10	-		197	4.00	197.3		Static water level
06/23/04	9:25	5		211	10.00	211.8	14.5	Start test, Q = surging/high Q as pump column fills
06/23/04	9:30	10		211		211.0	13.7	Throttle Q = 43 gpm
06/23/04	9:31	11		211	0.25	211.0	13.7	
06/23/04	9:32	12		211		211.0	13.7	
06/23/04	9:33	13		210	11.00	210.9	13.6	
06/23/04	9:34	14		210	11.00	210.9	13.6	
06/23/04	9:36	16		210	10.50	210.9	13.5	
06/23/04	9:37	17		210	10.25	210.9	13.5	
06/23/04	9:38	18		210	10.00	210.8	13.5	
06/23/04	9:39	19		210	10.25	210.9	13.5	
06/23/04	9:40	20		210	10.00	210.8	13.5	
06/23/04	9:41	21		210	10.00	210.8	13.5	
06/23/04	9:42	22		210	10.00	210.8	13.5	
06/23/04	9:43	23		210	10.50	210.9	13.5	
06/23/04	9:44	24		210	11.00	210.9	13.6	
06/23/04	9:45	25		210	10.75	210.9	13.6	
06/23/04	9:50	30		211	1.00	211.1	13.8	
06/23/04	9:55	35		211	0.50	211.0	13.7	
06/23/04	10:00	40		211	1.25	211.1	13.8	
06/23/04	10:05	45		211	1.50	211.1	13.8	
06/23/04	10:10	50		211	2.25	211.2	13.9	
06/23/04	10:15	55		211	2.00	211.2	13.8	
06/23/04	10:20	60		211	1.75	211.1	13.8	
06/23/04	10:25	65		211	2.00	211.2	13.8	
06/23/04	10:30	70		211	1.50	211.1	13.8	
06/23/04	10:35	75		211	1.50	211.1	13.8	
06/23/04	10:40	80		211	1.50	211.1	13.8	
06/23/04	10:45	85		211	2.00	211.2	13.8	
06/23/04	10:50	90		211	2.25	211.2	13.9	
06/23/04	10:55	95		211	3.00	211.3	13.9	
06/23/04	11:00	100		211	3.00	211.3	13.9	
06/23/04	11:10	110		211	2.75	211.2	13.9	
06/23/04	11:20	120		211	2.50	211.2	13.9	
06/23/04	11:30	130		211	3.25	211.3	13.9	
06/23/04	11:40	140		211	2.00	211.2	13.8	
06/23/04	11:50	150		211	1.75	211.1	13.8	
06/23/04	12:00	160		211	1.00	211.1	13.8	
06/23/04	12:10	170		211	1.00	211.1	13.8	Collected sample, T 68 F, pH, nm SC nm
06/23/04	12:20	180		211	1.25	211.1	13.8	
06/23/04	12:30	190		211	1.25	211.1	13.8	
06/23/04	12:40	200		211	1.25	211.1	13.8	Stopped test
Begin Recovery, pump off at:			06/23/04	12:40				
06/23/04	12:41	201	201	170.0		170.00	-27.3	
06/23/04	12:42	202	101	180.0	6.3	180.52	-16.8	
06/23/04	12:43	203	68	190.0	1.0	190.08	-7.3	
06/23/04	12:44	204	51	192.0	1.0	192.08	-5.3	
06/23/04	12:45	205	41	194.0	4.5	194.38	-3.0	
06/23/04	12:46	206	34	195.0	10.0	195.83	-1.5	
06/23/04	12:47	207	30	196.0	5.3	196.44	-0.9	
06/23/04	12:48	208	26	196.0	10.0	196.83	-0.5	
06/23/04	12:49	209	23	197.0	1.0	197.08	-0.3	
06/23/04	12:50	210	21	197.0	3.3	197.27.	-0.1	
06/23/04	12:51	211	19	197.0	3.3	197.27	-0.1	
06/23/04	12:53	213	16	197.0	4.0	197.33	0.0	
06/23/04	12:55	215	14	197.0	4.0	197.33	0.0	
06/23/04	12:57	217	13	197.0	4.0	197.33	0.0	
06/23/04	12:59	219	12	197.0	4.0	197.33	0.0	
06/23/04	13:05	225	9	197.0	4.0	197.33	0.0	

Notes and Comments:

Pump at ~225 ft.

Recovery data affected by drainage from 4" pump column.


Drawdown and Recovery
Spring Valley Ranch
Test Well SVR 9, Q = 43 gpm)
Test date: 6/23/2004
-30
-20
-10
0
10
20
Drawdown (feet)
0
60
120
180
240
Time (mins)

9E

Printed 05/24/2004
Drilling Permit No. 815596
Well Tag No. D0031492
Well ID # 386274
Water Right No.
Receipt # W031747
Approved Date 05/25/2004

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
DRILLING PERMIT

Relationship: Applicant
Name: SUNCOR
Address: 485 EAST RIVERSIDE DR SUITE 300
EAGLE ID 83616

Phone: (208)939-0343

Proposed Well Location: Township 05N, Range 01E, Section 9, SW, NE
COUNTY ADA Sub Name TEST WELL 9

Street Address of Well Site: 1/2 MILE SW OF WILLOW CREEK RD
EAGLE ID

Proposed Use of Well: Test

Well Construction Information:

A. New Well
B. Proposed Surface Diemeter: 8 Inches. Proposed Depth 800 Feet.
C. Anticipated Bottom Hole Temperature: 85F and less

Construction Start Date: May 25 2004

Anticipated Well Drilling Company: STEVENS & SONS WELL DRILLING INC (No. 153)

Applicant's Signature: See original application Date _____

Title: _____

9E

Well ID # 386274

Well Tag No. D0031492

ACTION OF THE DEPARTMENT OF WATER RESOURCES

This permit is Approved on Tuesday, May 25, 2004.

1. This drilling permit is valid for two (2) months from the approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the local Health District or the Idaho Department of Environmental Quality which may be required prior to construction of this well. The local Health District should be contacted for septic tank/drainfield locations. Domestic wells must not be drilled closer than 100 ft. from any drainfield and 50 ft. from any septic tank. Public Water Supply wells must not be drilled closer than 100 ft. from any drainfield or septic tank.
3. The well shall be constructed by a driller currently licensed in the state of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals that may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho. If the well being drilled is associated with approved water rights(s) use of the well must comply with conditions of said water right(s).
7. If a bottom hole temperature of 85 Degrees F (29.44 oC) or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department of Water Resources immediately.
8. Idaho Code, S 55-2201 - 55-2210 requires the applicant and/or its contractors to contact "Dig-line" (Dig-Line is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "Dig-Line " Number for this location is 1-800-342-1585
9. Please be advised that this drilling permit should be considered and treated as a preliminary permit. If you are in disagreement with this preliminary permit you have fourteen (14) days of the service date of this permit to petition the Idaho Department of Water Resources for reconsideration, pursuant to Section 67-5243, Idaho Code.
10. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.
11. This drilling permit has been approved for construction or drilling of an exploratory well intended to be used for collecting geologic, hydrologic or water quality data.
12. No water shall be produced from this well or any fluid injected into this well without specific written authorization from the Department.
13. Any surface casing installed in this well shall not exceed 8 inches nominal diameter.
14. All casing strings installed in this well shall be sealed their entire length with approved seal material and by positive means of placement unless otherwise authorized by this drilling permit.
15. A drilling prospectus including a schematic diagram and construction narrative describing all pertinent features of the well including drilling methods, seal material and placement methods, casing schedules and specifications shall be submitted for review by the Department and attached to this drilling permit prior to the start of construction.

16. No casing installed in this well shall be drilled and driven through multiple aquifers, unless it is completely removed and the borehole is properly sealed or the casing is perforated at appropriate intervals and pressure grouted with approved grout. Drilling and driving casing may be allowed above the water table or where multiple aquifers are not encountered provided that the casing is sealed as required by administrative rules.
17. This well shall be properly plugged in accordance with a plan approved by the department at least 30 days prior to the expiration of the bond.
18. The bond secured for abandonment of this well shall be valid for the entire time the well remains open. The Department will give the well owner 60 days notice prior to the expiration of the bond that the well must be properly plugged. If the well owner has not properly plugged the well at least 30 days prior to he expiration of the bond, the Director may commence action to attached the bond and hire a licensed driller to properly plug the well.
19. Drilling of this well shall not commence until the Department has received a document from the surety company or bank stating that the bond is in full force and effect and the Department has determined the amount of the bond is sufficient.
20. This drilling permit is not valid unless the well owner has secured a bond in favor of the Director in an amount sufficient for proper plugging and abandonment of the well. The bond shall remain in effect and accessible by the Director until this well is plugged. The bond amount for this well shall be at least $7,200.

Signature of Authorized Dept Representative

Sr WR Agent
Title

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
PROJECT: SPRING VALLEY RANCH SVR 9 (AS DISSOLVED)

Time of Collection: 12:15
Date of Collection: 6/23/2004
Date Received: 6/23/2004
Report Date: 7/19/2004

PWS:

Laboratory Analysis Report

Sample Number: 0420336

SAMPLE FILTERED USING 0.45 UM FILTER PRIOR TO ANALYSIS.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace	0.05	<0.005	mg/L	0.005	SM 3113 B	6/27/2004	DMB
Beryllium Furnace	0.004	<0.0005	mg/L	0.0005	SM 3113 B	6/28/2004	DMB
Barium, Ba	2	0.10	mg/L	0.05	EPA 200.7	7/7/2004	JH
Antimony Furnace	0.006	<0.005	mg/L	0.005	SM 3113 B	7/6/2004	DMB
Chromium Furnace	0.1	<0.002	mg/L	0.002	SM 3113 B	7/1/2004	DMB
Mercury, Hg	0.002	<0.0002	mg/L	0.0002	EPA 245.1	6/30/2004	DMB
Iron, Fe	UR	0.60	mg/L	0.05	EPA 200.7	7/1/2004	JH
Manganese, Mn	UR	0.12	mg/L	0.05	EPA 200.7	7/1/2004	JH
Nickel, Ni	UR	<0.02	mg/L	0.02	EPA 200.7	7/1/2004	JH
Thallium Furnace	0.002	<0.002	mg/L	0.002	EPA 200.9	6/29/2004	DMB
Sodium, Na	UR	26.9	mg/L	0.10	EPA 200.7	6/28/2004	JH
Calcium, Ca	UR	24.9	mg/L	0.10	EPA 200.7	6/28/2004	JH
Magnesium, Mg	UR	10.4	mg/L	0.10	EPA 200.7	6/28/2004	JH
Potassium, K	UR	2.0	mg/L	0.5	EPA 200.7	6/28/2004	JH
Metals Filtering		*				6/23/2004	KC
Cadmium Furnace	0.005	<0.0005	mg/L	0.0005	SM 3113 B	7/17/2004	DMB

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Laboratory Analysis Report

Sample Number: 0420336

SAMPLE FILTERED USING 0.45 UM FILTER PRIOR TO ANALYSIS.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Selenium Furnace	0.05	<0.005	mg/L	0.005	SM 3113 B	7/15/2004	DMB
Nitrate (as N)	10	<0.2	mg/L	0.2	EPA 300.0	6/24/2004	WW
Nitrite (as N)	1.00	<0.01	mg/L	0.01	EPA 353.2	6/25/2004	ARR
Ammonia Direct (as N)	UR	0.10	mg/L	0.04	EPA 350.1	6/25/2004	WW
Fluoride, F	4.0	0.45	mg/L	0.10	EPA 300.0	6/25/2004	WW
Bicarbonate		107	mg/L		SM 2320	6/29/2004	ARR
Sulfate, SO4	UR	44	mg/L	1	EPA 300.0	6/24/2004	WW
Chloride, Cl	UR	10	mg/L	1	EPA 300.0	6/24/2004	WW
pH	UR	2.5	S.U.		EPA 150.1	6/25/2004	WW
Conductivity	UR	336	umhos	2	EPA 120.1	6/24/2004	WW
Hardness	UR	102	mg/L	5.0	SM 2340	6/29/2004	ARR
Total Dissolved Solids	UR	216	mg/L	25	EPA 160.1	6/25/2004	DLR

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,

please contact: **Michael Moore**

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0420337

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
PROJECT: SPRING VALLEY RANCH SVR 9 (UNFILTERED)

Time of Collection: 12:15
Date of Collection: 6/23/2004
Date Received: 6/23/2004
Report Date: 6/28/2004

PWS:

SAMPLE COULD NOT BE FILTERED; IT WAS COLLECTED IN A PREPRESERVED BOTTLE.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Sulfide, Dissolved (as H2S)		<0.05	mg/L	0.05	SM 4500-S2 D	6/25/2004	DLR

Michael D. Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Appendix D
Supplementary Data
Spring Valley Ranch Exploration Well SVR 10

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No. 815597
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0031493
DRILLING PERMIT NO. 815597
Water Right or Injection Well No.

2. OWNER:
Name SUNCOR
Address 485 EAST RIVERSIDE DR SUITE 300
City EAGLE ID State ID Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 05 North ☒ or South ☐
Rge. 01 East ☒ or West ☐
Sec. 8, SW 1/4 (10 acres) SW 1/4 (40 acres) ____ 1/4 (160 acres)
Gov't Lot ____ County ADA
Lat: : : Long: : :
Address of Well Site 1/2 MILE NE OF WILLOW CREEK RD City EAGLE
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other TEST WELL

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable ☒ Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
30% B. GROUT	1	500	4000 LB	PRESSURE GROUTED
30% B. GROUT	1000	770	1470 LB	PRESSURE GROUTED

Was drive shoe used? ☒Y ☐N Shoe Depth(s) ____
Was drive shoe seal tested? ☐Y ☒N How? ____
GRAVEL 3/8 FROM 770 TO 666

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	600	.250	STEEL	☒	☐	☐	☐
6"	630	600	.280	STEEL	☐	☒	☒	☐
					☐	☐	☐	☐

Length of Headpipe 25 FT Length of Tailpipe 0
Packer ☒Y ☐N Type ____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method ____
Screen Type & Method of Installation STAINLESS STEEL

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
640	630	.40	—	6"	STAINLESS	☐	☐
600	580	.30	—	6"	STAINLESS	☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
NONE				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
485 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: ____
well cap

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
AIR 50 GPM	—	—	—

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	1	15	TOP SOIL & SAND		
	15	35	SANDY CLAY		
	35	360	COARSE SAND		
	360	380	COARSE SAND + CLAY		
	380	480	COARSE SAND & CLAY MIX		
	480	490	COARSE SAND & CLAY MIX		
	490	505	TAN CLAY		
	505	520	SAND & CLAY MIX		
	520	530	SAND		
	530	560	SAND & CLAY		
	560	590	MORE SAND LESS CLAY COARSE		
	590	620	CLAY TAN & WHITE		
	620	632	CLAY W/ SAND STREAKS		
	632	640	SHORT SAND STREAKS IN CLAY		
	640	660	TAN CLAY		
	660	670	TAN CLAY		
	670	680	SOFT WHITISH CLAY		
	680	687	WHITISH CLAY + BLUE CLAY - SAND		
	687	690	HARD CLAY BLUISH		
	690	715	BLUE CLAY - COARSE SAND		
	715	740	BLUE CLAY HARD & SOFT		
	740	760	BLUE CLAY		
	760	800	BLUE CLAY		
	800	825	BLUE CLAY SHORT SOFT SPOTS		
	825	835	BLUE CLAY		
	835	860	BLUE + WHITE CLAY		
	860	880	BLUE CLAY W/ COARSE SAND		
	880	920	SOFT BLUE CLAY		
	920	940	BLUE CLAY		
	940	980	BLUE CLAY		
	980	1005	BLUE CLAY		

RECEIVED
AUG 16 2004
WATER RESOURCES
WESTERN REGION

Completed Depth 770' (Measurable)
Date: Started 6-7-04 Completed 7-29-04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name ADAMSON PUMP & DRILLING Firm No. 457
Principal Driller Dave Adamson Date 7-30-04
and
Driller or Operator II Dave Adamson Date 7-30-04
Operator I ____ Date ____
Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

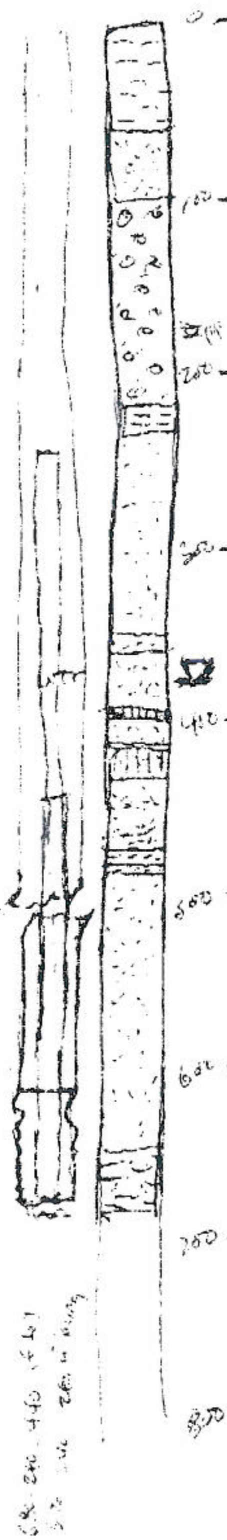
SECOND SVR-10 WELL

(First SVRID Well)

Feast Geosciences, LLC
9730 Tenner Lane, Boise, ID 83709
Tel. 208 599-4501, Fax 208 362-9348

Subject: SVRID (Adamson's Log)

Drawn by:
Date: 6/28/04
Project No.:
Page: of



0 - 15	Brown clay
15 - 60	Tan clay w/ course sand
60 - 63	Course sand, hard driving 62 - 63
63 - 100	Course sand (dry) & Tan clay (steady drilling)
100 - 140	Pea gravel, Quartz color & course sand
140 - 220	Gravel & pea gravel and sand
220 - 235	Sandy clay (coarse) tan
235 - 260	Sand (whitish) quartz
260 - 280	Sand quartz, white
280 - 305	Sand, quartz, hard driving, casing tight 278-290
305 - 340	Sand as above, casing easier to drive
340 - 347	Sand as above, soft
347 - 355	Course sand & gray clay
355 - 380	Course sand
380 - 390	Course sand, water at start up
390 - 395	Siltstone & course sand
395 - 405	Course sand, hard driving, some gray clay
405 - 418	Course sand, occ. clay chunk
418 - 420	Tan clay
420 - 435	Siltstone & course sand
435 - 440	Course sand, "holding together"
440 - 460	Course sand some fine sand, siltstone fragments
460 - 470	Course sand w/ bedded clay & siltstone
470 - 475	Clay & siltstone w/ minor course sand
475 - 481	Clay w/ course sand

drilled open hole, hole stayed open, Adamson call Christian. PC said put casing down. casing fell 465 470 then got tight 475 - 478

481 - 485	Sand & clay pieces, hard driving
485 - 498	Sand, easy driving
498 - 520	Sand, casing fell "a little coarse sand"
520 - 540	Course sand, pumped water @ 540 (30 gpm)
540 - 555	Course sand, casing fell
555 - 600	Course sand, driving harder
600 - 620	Course sand, very hard driving, thinks sand is outside casing
620 - 650	Course sand w/ minor clay
650 - 660	Course sand, clay in casing
660 - 680	Course sand & white clay

Tripped hole to change bits, drill bit stuck @ 520, unable to remove after 1 wk, backed off & pulled 260 ft drill pipe

Exploration Hole SVR 10

Spring Valley Ranch

Drilled by: Adamson Pump and Drilling.
Logged by: C. Feast/Feast Geosciences, LLC
Geophysical logs by: Stevens and Son
Fluid level when logged: Surface
Casing when logged: 600 ft

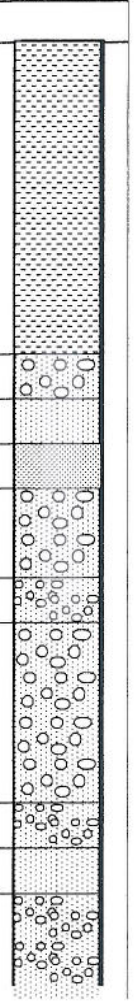
Drilled Dates: 6/7 - 7/29/04
Drilling Method: Mud Rotary
Borehole size: 12" (nom.) 0 - 1005 ft

Depth Drilled: 1005 ft
Depth Logged: 960 ft.
Static WL: ~ 485 ft. bgl

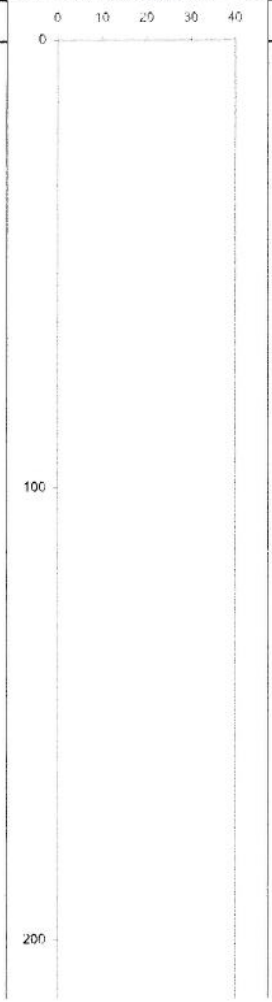
Location: Ada County, Idaho
T 5 N, R 1 E, sw1/4, sw1/4, Sect. 8
GL. Elevation: ~ 2,870 ft. msl.

Depth (ft)	Geologic log from rotary cuttings
0	Top soil over clay, soft, plastic, coarse qtz. sand grains, buff-yellow brown.
70	Sand and gravel, cs-vcs sand, fine gravel, clean, light gray
80	Sand, cs-vcs, clean, light gray
90	Sand, med-cs, minor fines, light brown
100	Sand and gravel, cs-vcs sand, med-cs gravel, clean, light gray
120	Sand and gravel, cs-vcs sand, med gravel, clean, light gray
130	Sand and gravel, cs-vcs sand, med-cs gravel, clean, light gray
170	Sand and gravel, cs-vcs sand, fine gravel, clean, light gray
180	Sand, cs-vcs, clean, light gray
190	Sand and gravel, cs-vcs, fine gravel, clean, light gray
200	

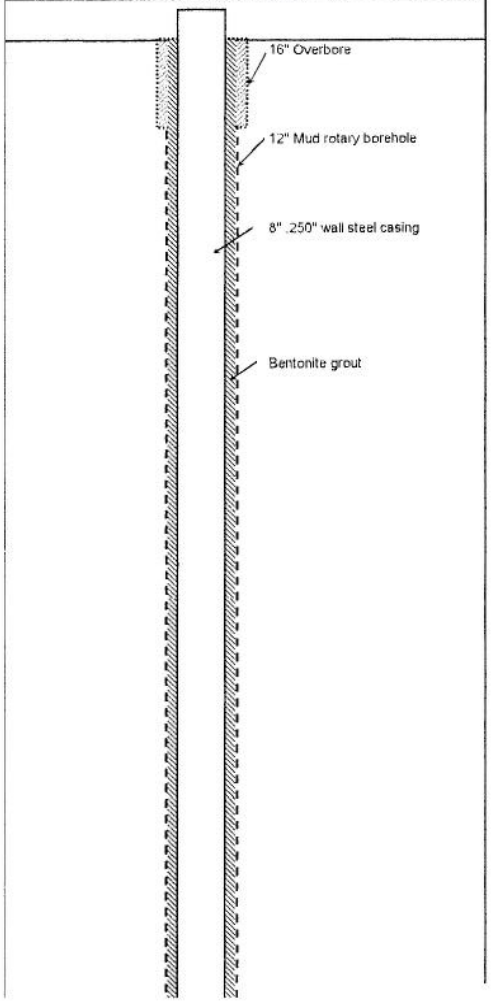
Symb. Log



Pt. Res (Relative Ohms)



Well Construction



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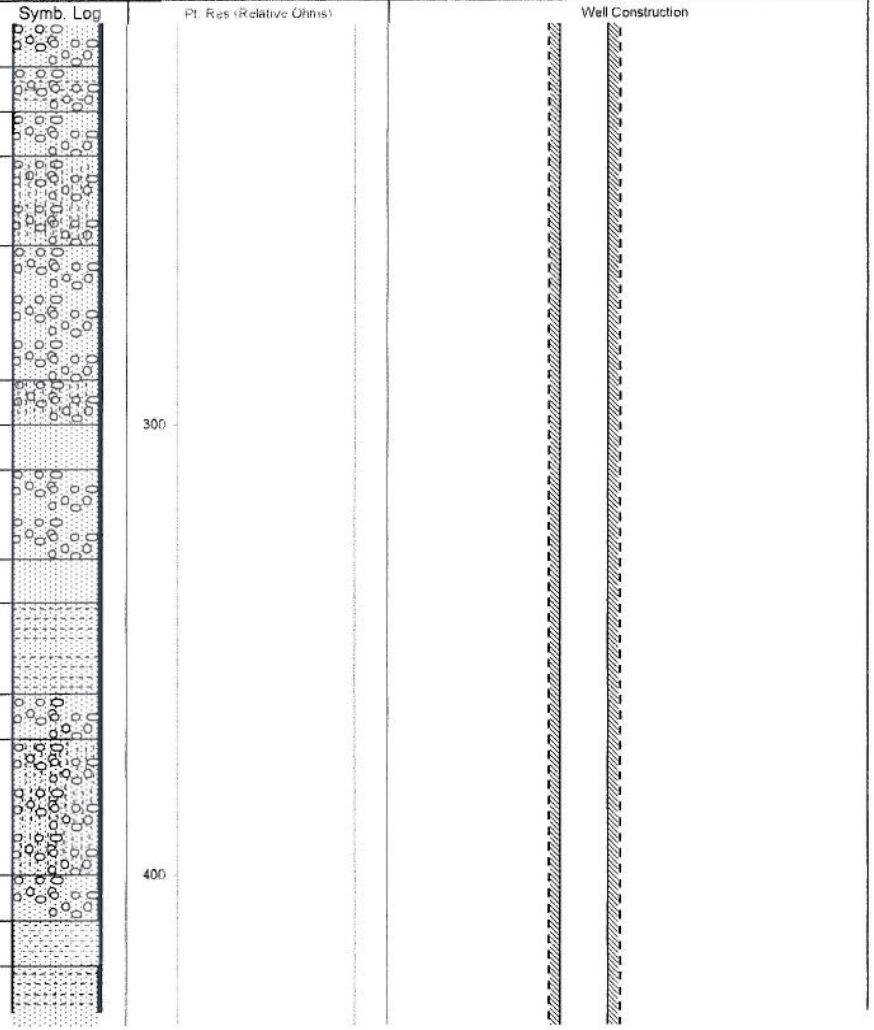
Location: Ada County, Idaho
T 5 N, R 1 E, sw1/4, sw1/4, Sect. 8
GL. Elevation: ~ 2,870 ft. msl.

Depth (ft)	Geologic log from rotary cuttings
210	
220	Sand and gravel, med-cs sand, fine gravel, minor clay, light brown
230	Sand and gravel, med-cs sand, fine gravel, clean, light brown
240	Sand and gravel, cs-vcs, sand, fine gravel, minor silt, light gray
250	
260	Sand and gravel, cs-vcs, fine gravel, clean, light gray
270	
280	
290	Sand and gravel, cs-vcs, sand, fine gravel, minor silt, light gray
300	Sand, cs-vcs, clean, light gray
310	Sand and gravel, cs-vcs, fine gravel, clean, light gray
320	
330	Sand, cs-vcs, clean, light gray
340	Sand, cs-vcs, clayey, gray
350	
360	Sand and gravel, cs-vcs, fine gravel, clean, gray
370	Sand and gravel, cs-vcs, fine to med gravel, clayey, gray
380	
390	
400	Sand and gravel, cs-vcs, fine gravel, clean, gray
410	Clay, sandy, gray
420	Sand, clayey, cs sand, gray



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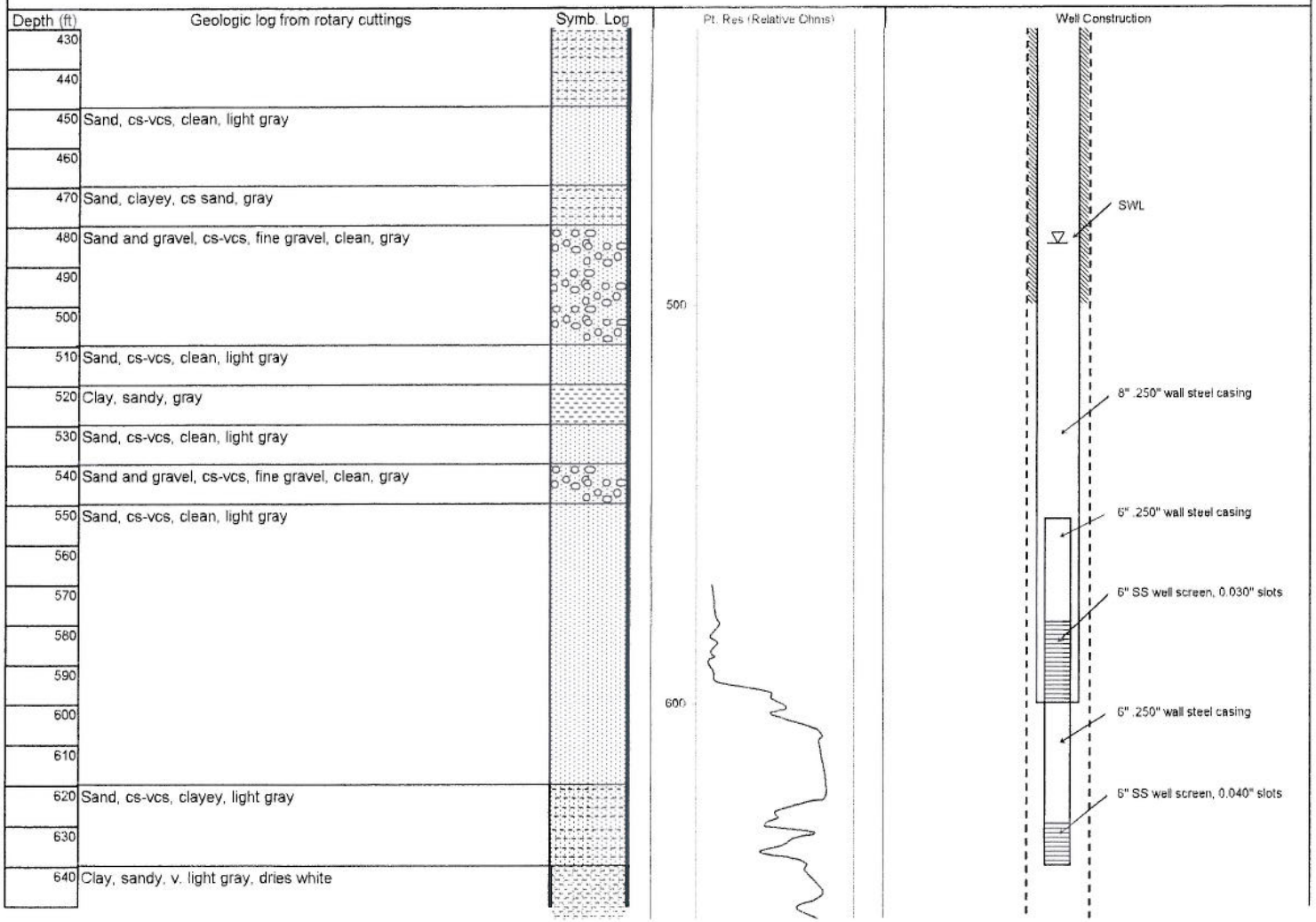
Depth Drilled: 1005 ft
Depth Logged: 960 ft.
Static WL: ~ 485 ft. bgl

Location: Ada County, Idaho
T 5 N, R 1 E, sw1/4, sw1/4, Sect. 8
GL. Elevation: ~ 2,870 ft. msl.

Depth (ft)	Geologic log from rotary cuttings
430	
440	
450	Sand, cs-vcs, clean, light gray
460	
470	Sand, clayey, cs sand, gray
480	Sand and gravel, cs-vcs, fine gravel, clean, gray
490	
500	
510	Sand, cs-vcs, clean, light gray
520	Clay, sandy, gray
530	Sand, cs-vcs, clean, light gray
540	Sand and gravel, cs-vcs, fine gravel, clean, gray
550	Sand, cs-vcs, clean, light gray
560	
570	
580	
590	
600	
610	
620	Sand, cs-vcs, clayey, light gray
630	
640	Clay, sandy, v. light gray, dries white



Exploration Hole SVR 10

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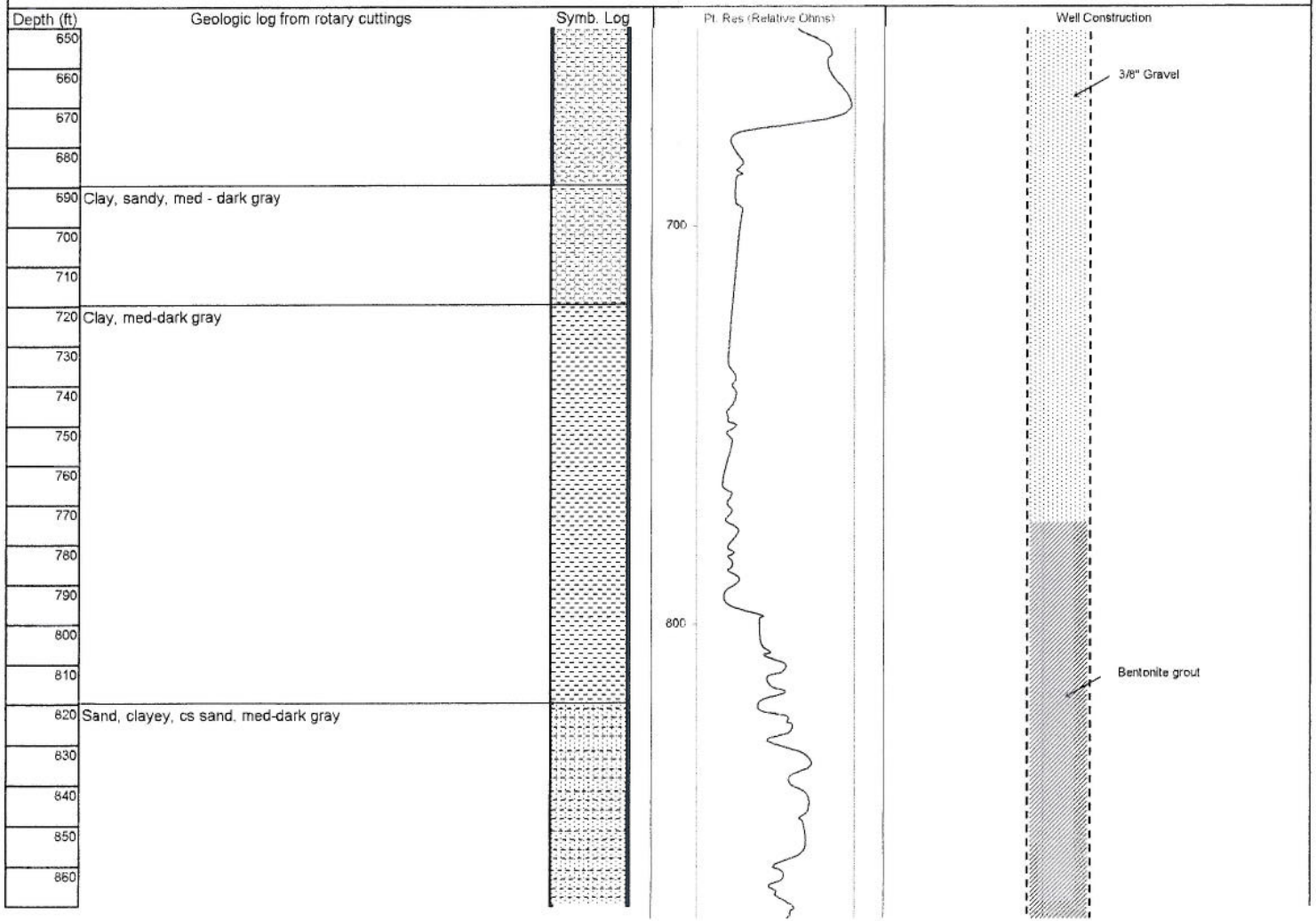

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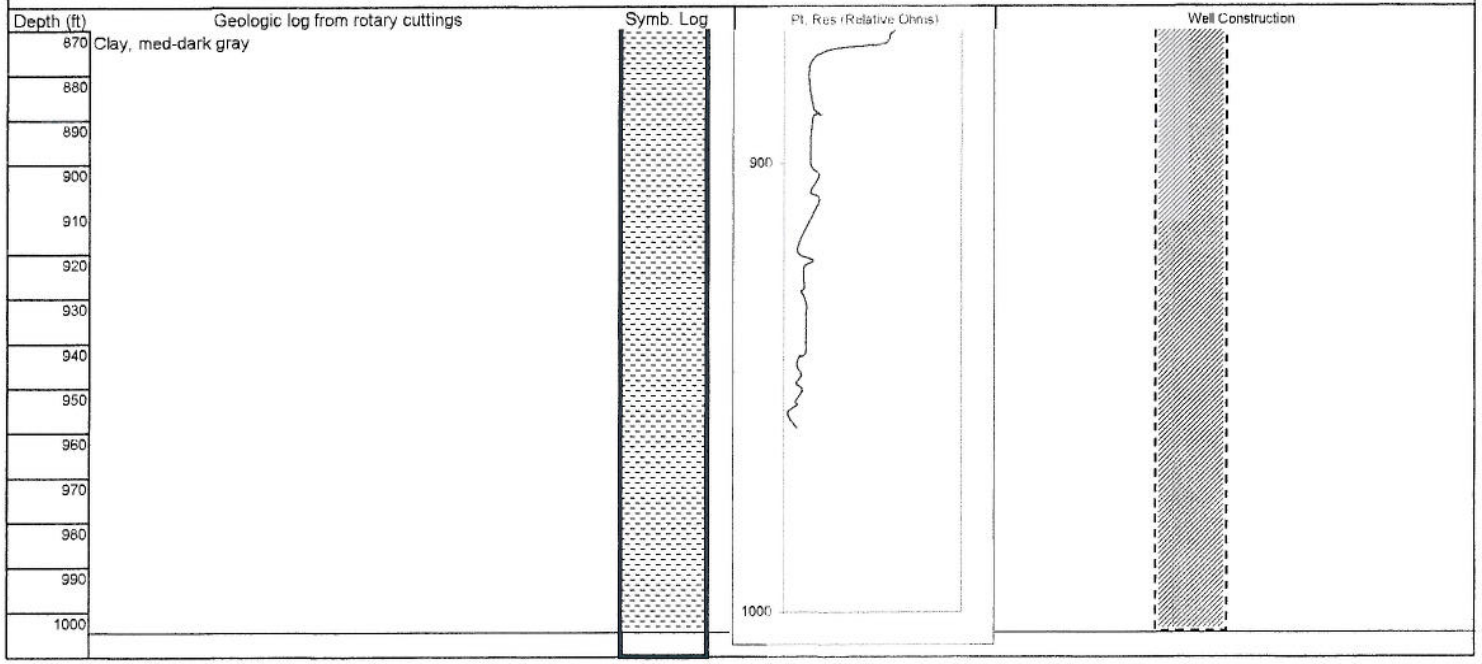


AQUIFER TEST DATA

Well No.: **Spring Valley Ranch, Test Well SVR 10** **Q = 55 gpm, t = 24 hours**

Test conducted by:Adamson Pump and Drilling Co.
Flow measured by: Bucket and watch
Water levels measured by: Well sounder Water level measure point: Top of 1" poly tube
MP Elevation: 3.0 ft agl Static WL (ft bmp): 485.08
Pump on: 08/19/04 11:32 Pump off: 08/20/04 11:33

				Water Level Data				
Date	Time	t (mins)	t/t'	Ref (ft.)	Measure (in.)	WL (ft bmp)	Drawdown (feet)	Comments
08/19/04	11:00	-		485	1	485.1		Static water level
08/19/04	11:30	-		485	1	485.1	0.0	SWL meter 015670
08/19/04	11:32	0		520		520.0	34.9	Q = 55 gpm
08/19/04	11:33	1		526		526.0	40.9	
08/19/04	11:35	3		532		532.0	46.9	
08/19/04	11:37	5		536		536.0	50.9	
08/19/04	11:38	6		540		540.0	54.9	
08/19/04	11:39	7		543		543.0	57.9	Q = 55 gpm
08/19/04	11:40	8		544	11	544.9	59.8	Q = 55 gpm
08/19/04	11:45	13		544	11	544.9	59.8	
08/19/04	12:25	53		544	11	544.9	59.8	
08/19/04	13:00	88		544	11	544.9	59.8	
08/19/04	13:30	118		544	10.75	544.9	59.8	Q = 55 gpm
08/19/04	14:00	148		544	10.50	544.9	59.8	Q = 55 gpm, water clear
08/19/04	14:30	178		544	10	544.8	59.8	
08/19/04	15:00	208		544	10	544.8	59.8	
08/19/04	15:30	238		544	11	544.9	59.8	Water meter stuck
08/19/04	16:00	268		544	11	544.9	59.8	Q = 55 gpm, water clear
08/19/04	16:30	298		545	10.5	545.9	60.8	
08/19/04	17:00	328		545	11	545.9	60.8	
08/19/04	17:30	358		545	11	545.9	60.8	
08/19/04	18:00	388		544	11	544.9	59.8	
08/19/04	18:30	418		544	10.5	544.9	59.8	
08/19/04	19:00	448		544	10.5	544.9	59.8	
08/19/04	19:30	478		544	10	544.8	59.8	
08/19/04	20:00	508		545		545.0	59.9	
08/19/04	20:30	538		545		545.0	59.9	Sampled; T 24.4 °C (75.9°F), EC 160 µS , pH 7.64
08/19/04	21:00	568		545		545.0	59.9	
08/19/04	21:30	598		545		545.0	59.9	
08/19/04	22:00	628		545		545.0	59.9	the same meter reading as at 22:00
08/19/04	22:30	658		545		545.0	59.9	the same meter reading as at 22:00
08/19/04	23:30	718		545		545.0	59.9	
08/20/04	0:30	778		545		545.0	59.9	
08/20/04	1:30	838		545		545.0	59.9	
08/20/04	2:30	898		545		545.0	59.9	
08/20/04	3:30	958		545		545.0	59.9	
08/20/04	4:30	1018		545		545.0	59.9	
08/20/04	5:30	1078		545		545.0	59.9	
08/20/04	6:30	1138		545		545.0	59.9	
08/20/04	7:30	1198		545		545.0	59.9	still having meter problems
08/20/04	8:20	1248		545		545.0	59.9	meter working again
08/20/04	8:30	1258		545		545.0	59.9	
08/20/04	9:30	1318		545		545.0	59.9	Meter 16013
08/20/04	10:30	1378		545		545.0	59.9	Meter 16043
08/20/04	11:32	1440		545		545.0	59.9	Meter 16071
08/20/04	11:33	1441		545		545.0	59.9	Stopped test
Begin Recovery, pump off at:			08/20/04	11:33				
08/20/04	11:34	1442	1442	525.0		525.0	39.9	
08/20/04	11:35	1443	722	510.0		510.0	24.9	
08/20/04	11:36	1444	481	500.9		500.9	15.8	
08/20/04	11:37	1445	361	493.7		493.7	8.6	
08/20/04	11:38	1446	289	489.0		489.0	3.9	
08/20/04	11:39	1447	241	486.4		486.4	1.3	
08/20/04	11:41	1449	181	485.3		485.3	0.2	
08/20/04	11:45	1453	121	485.1		485.1	0.0	
08/20/04	11:46	1454	112	485.1		485.1	0.0	
08/20/04	11:47	1455	104	485.0		485.0	-0.1	
08/20/04	11:49	1457	91	485.1		485.1	0.0	
08/20/04	11:51	1459	81	485.1		485.1	0.0	
08/20/04	11:53	1461	73	485.1		485.1	0.0	
08/20/04	11:57	1465	61	485.1		485.1	0.0	
08/20/04	12:03	1471	49	485.1		485.1	0.0	

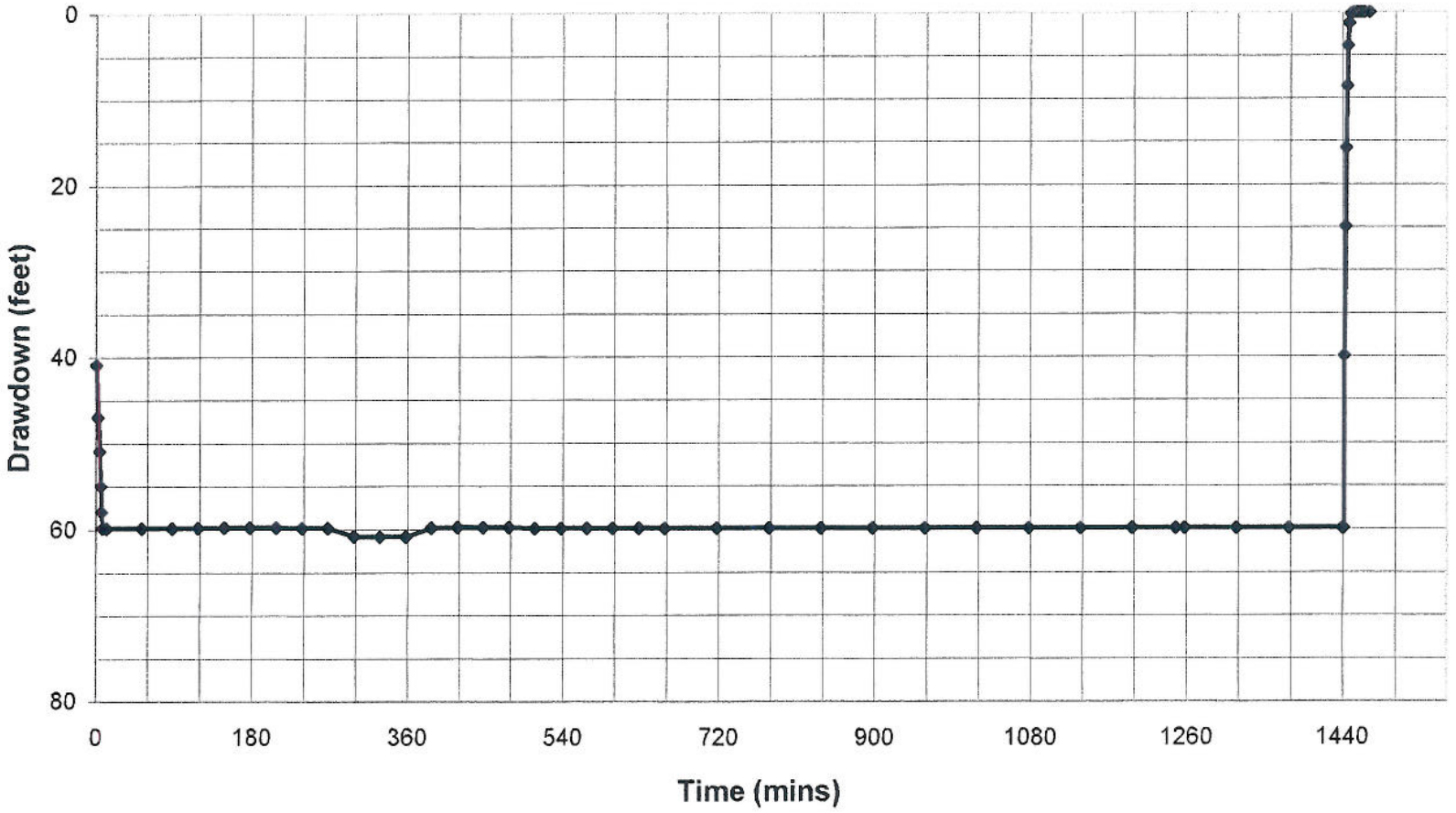
Notes and Comments:
Pump at ~565 ft.
Recovery data affected by drainage from 4" pump column.

Drawdown and Recovery

Spring Valley Ranch

Test Well SVR 10, Q = 55 gpm)

Test date: 8/19/2004

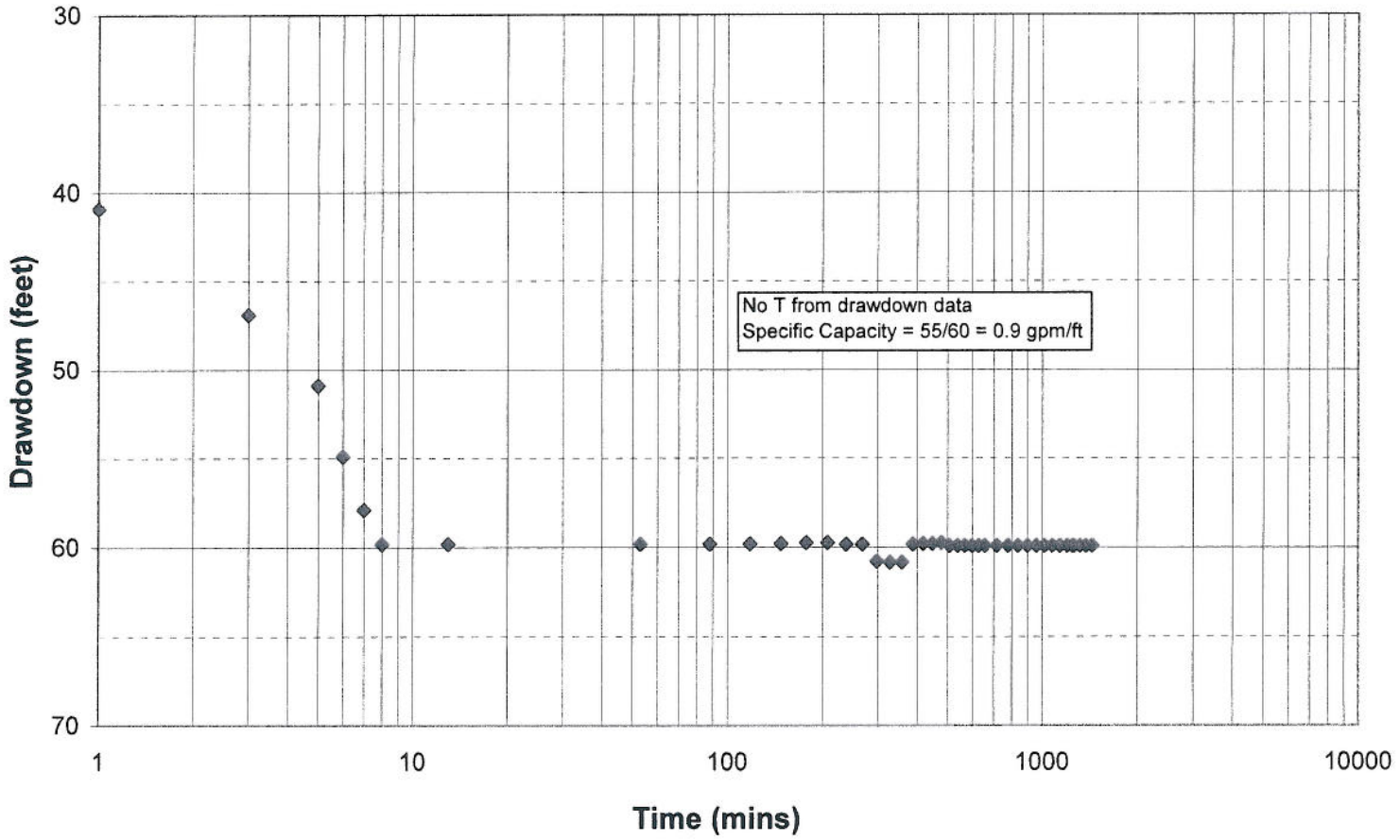


Time - Drawdown

Spring Valley Ranch

Test Well SVR 10, Q = 55 gpm

Test date: 8/19/2004

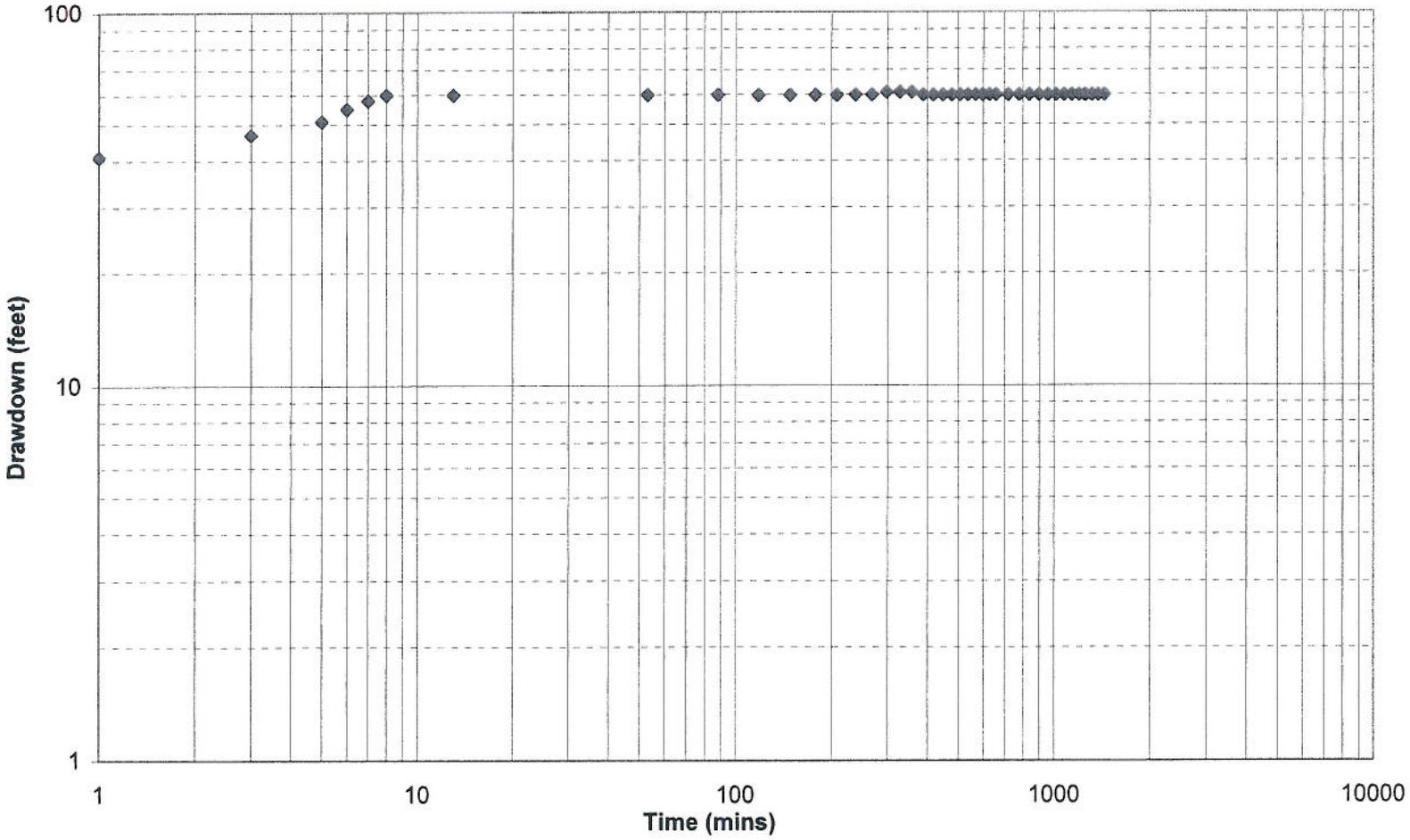


Time - Drawdown

Spring Valley Ranch

Test Well SVR 10, Q = 55 gpm

Test date: 8/19/2004

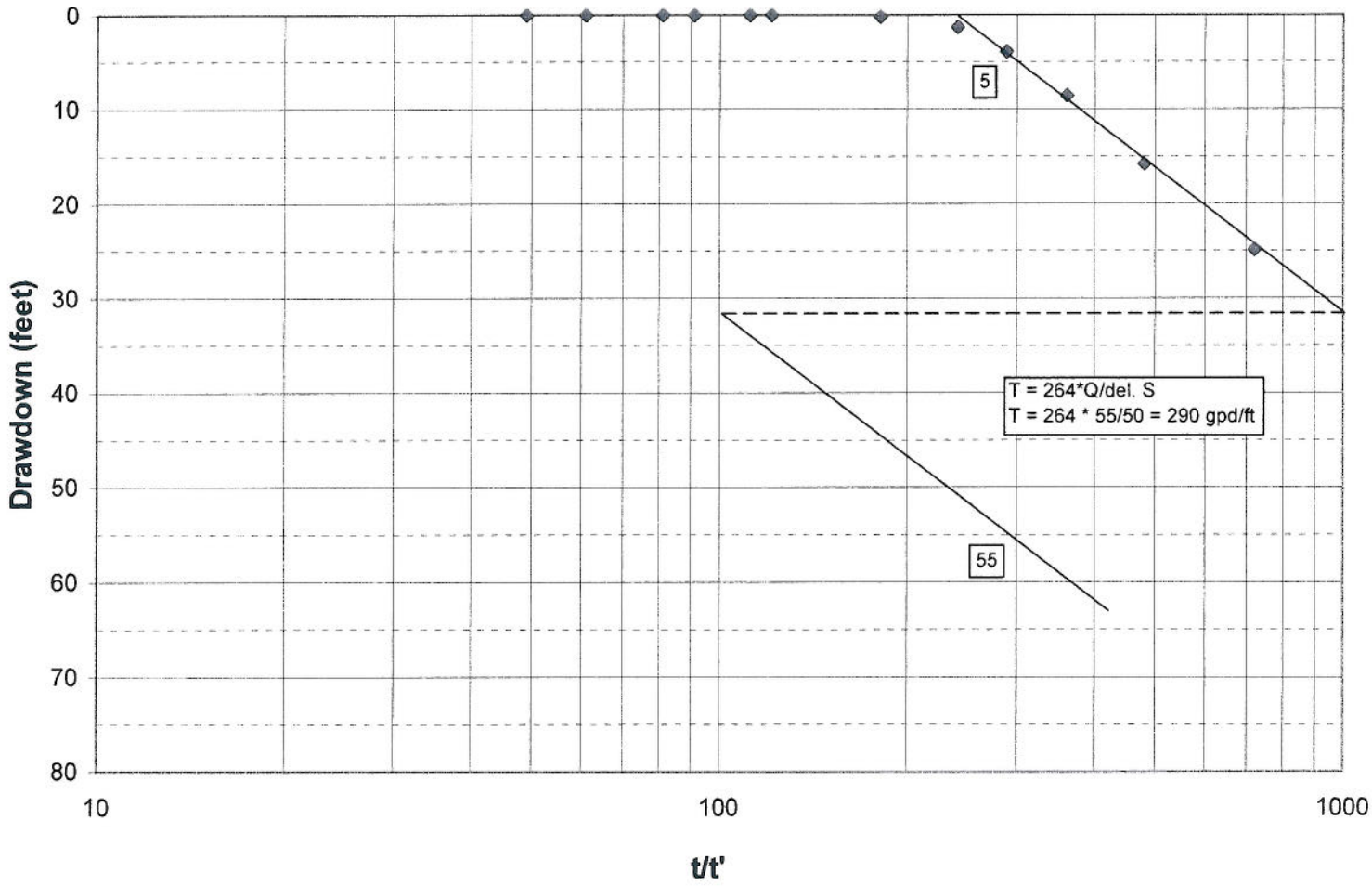


Time - Recovery

Spring Valley Ranch

Test Well SVR 10, Q = 55 gpm

Test date: 8/19/2004



Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
PROJECT: SPRING VALLEY RANCH SUR-10

Time of Collection: 20:30
Date of Collection: 8/19/2004
Date Received: 8/20/2004
Report Date: 9/7/2004

PWS:

Laboratory Analysis Report

Sample Number: 0428005

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Antimony Furnace	0.006	<0.005	mg/L	0.005	SM 3113 B	8/31/2004	DMB
Arsenic Furnace	0.05	0.012	mg/L	0.005	SM 3113 B	9/1/2004	DMB
Barium, Ba	2	<0.05	mg/L	0.05	EPA 200.7	8/30/2004	JH
Calcium, Ca	UR	17.1	mg/L	0.10	EPA 200.7	8/23/2004	JH
Chromium Furnace	0.1	0.002	mg/L	0.002	SM 3113 B	8/26/2004	DMB
Iron, Fe	UR	0.36	mg/L	0.05	EPA 200.7	9/2/2004	JH
Magnesium, Mg	UR	3.20	mg/L	0.10	EPA 200.7	8/23/2004	JH
Manganese, Mn	UR	<0.05	mg/L	0.05	EPA 200.7	9/2/2004	JH
Mercury, Hg	0.002	<0.0002	mg/L	0.0002	EPA 245.1	9/1/2004	KC
Nickel, Ni	UR	<0.02	mg/L	0.02	EPA 200.7	8/23/2004	JH
Potassium, K	UR	2.4	mg/L	0.5	EPA 200.7	8/23/2004	JH
Sodium, Na	UR	12.3	mg/L	0.10	EPA 200.7	8/23/2004	JH
Thallium Furnace	0.002	<0.002	mg/L	0.002	EPA 200.9	8/29/2004	DMB
Cadmium Furnace	0.005	<0.0005	mg/L	0.0005	SM 3113 B	8/26/2004	DMB
Beryllium Furnace	0.004	<0.0005	mg/L	0.0005	SM 3113 B	8/27/2004	DMB
Selenium Furnace	0.05	<0.005	mg/L	0.005	SM 3113 B	9/1/2004	DMB

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Laboratory Analysis Report

Sample Number: 0428005

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Ammonia Direct (as N)	UR	<0.04	mg/L	0.04	EPA 350.1	8/23/2004	WW
Nitrate (as N)	10	5.2	mg/L	0.2	EPA 300.0	8/20/2004	WW
Monitoring recommended.							
Nitrite (as N)	1.00	<0.01	mg/L	0.01	EPA 353.2	8/20/2004	ARR
Hardness	UR	51.8	mg/L	5.0	SM 2340	8/26/2004	ARR
Bicarbonate		53.5	mg/L		SM 2320	8/26/2004	ARR
Chloride, Cl	UR	2	mg/L	1	EPA 300.0	8/24/2004	WW
Fluoride, F	4.0	0.24	mg/L	0.10	EPA 300.0	8/30/2004	WW
Sulfate, SO4	UR	<1	mg/L	1	EPA 300.0	8/24/2004	WW
Sulfide	UR	<0.05	mg/L	2	SM 4500-S2 D	8/23/2004	PM
Total Dissolved Solids	UR	70	mg/L	25	EPA 160.1	8/24/2004	PM

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions concerning this report,

please contact: **Michael Moore**

LAB FEDERAL ID#: **ID00020**	LAB SAMPLE #: **0428005**
DATE LAB REC'D SAMPLE: 8/20/2004	DATE REPORTED BY LAB: 9/7/2004
COMPLIANCE SAMPLE ☐ YES ☐ NO	REPLACEMENT SAMPLE ☐
COLLECTION DATE: 8/19/2004	COLLECTION TIME: (24 hour clock) 20:30
SAMPLE TYPE: ☐ CO-confirmation ☐ RP-repeat ☐ RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other	
PWS#:	PWS NAME:
SAMPLING POINT/LOCATION:	TAG #/FACILITY ID:
PROJECT: SPRING VALLEY RANCH SUR-10	
COLLECTOR'S NAME: C FEAST	CONTACT PHONE # (208) 383-4140

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

http://www.analyticallaboratories.com

PUBLIC DRINKING WATER SYSTEM INORGANIC CHEMICAL (IOC) ANALYSIS REPORT:

Phase II							
FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst
1010	Barium	ND	EPA 200.7	2	0.05	8/30/2004	JH
1015	Cadmium	ND	SM 3113 B	0.005	0.0005	8/26/2004	DMB
1020	Chromium	0.002	SM 3113 B	0.1	0.002	8/26/2004	DMB
1035	Mercury	ND	EPA 245.1	0.002	0.0002	9/1/2004	KC
1038	Ttl(N02/N03)	---		10			
1040	Nitrate	5.2	EPA 300.0	10	0.2	8/20/2004	WW
1041	Nitrite	ND	EPA 353.2	1.0	0.01	8/20/2004	ARR
1045	Selenium	ND	SM 3113 B	0.05	0.005	9/1/2004	DMB
1024	Cyanide	---		0.2			
Secondary IOCs (optional)							
1050	Silver	---		0.1			
1049	Silica, As SiO2	---					
1042	Potassium	2.4	EPA 200.7		0.5	8/23/2004	JH
1032	Manganese	ND	EPA 200.7	0.05	0.05	9/2/2004	JH
1031	Magnesium	3.20	EPA 200.7		0.1	8/23/2004	JH
1028	Iron	0.36	EPA 200.7	0.3	0.05	9/2/2004	JH
1027	Hydrogen Sulfide	ND	SM 4500-S		0.05	8/23/2004	PM
1022	Copper	---		1.0			
1017	Chloride	2	EPA 300.0	250	1	8/24/2004	WW
1016	Calcium	17.1	EPA 200.7		0.1	8/23/2004	JH
1003	Ammonia as N	ND	EPA 350.1		0.04	8/23/2004	WW
1002	Aluminum	---		0.05-			

Phase V							
FRDS	Contaminant Name	Result*	Method	MCL*	MDL*	Analysis Date	Analyst
1085	Thallium	ND	EPA 200.9	0.002	0.002	8/29/2004	DMB
1075	Beryllium	ND	SM 3113 B	0.004	0.0005	8/27/2004	DMB
1074	Antimony	ND	SM 3113 B	0.006	0.005	8/31/2004	DMB
1036	Nickel	ND	EPA 200.7	n/a	0.02	8/23/2004	JH
Other IOCs							
1052	Sodium	12.3	EPA 200.7	n/a	0.1	8/23/2004	JH
1025	Fluoride	0.24	EPA 300.0	4.0	0.1	8/30/2004	WW
1005	Arsenic	0.012	SM 3113 B	0.05	0.005	9/1/2004	DMB
Secondary IOCs (optional)							
2905	Surfactants	---					
1997	Langlier Index	---					
1930	Dissolved Solids	70	EPA 160.1	500	25	8/24/2004	PM
1927	Alkalinity as CaC03	---					
1926	Conductivity uS/cm	---					
1925	pH	---		6.5-8.			
1920	Odor (Threshold #)	---		3			
1915	Hardness as CaC03	51.8	SM 2340		5	8/26/2004	ARR
1905	Color	---		15c.u.			
1095	Zinc	---		5			
1055	Sulfate	ND	EPA 300.0	250	1	8/24/2004	WW

TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID, 83706

*Reported in mg/L unless otherwise noted
ND = Not detected within sensitivity of instrument
--- = No analysis performed
MDL = Method detection limit

Signature of Laboratory Supervisor

9/8/04
Date

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0428002

Attn: TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
PROJECT: SPRING VALLEY RANCH SUR-10

Time of Collection: 20:30
Date of Collection: 8/19/2004
Date Received: 8/20/2004
Report Date: 9/22/2004

PWS:

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 09/22/04.
*ND=NONE DETECTED @ 0.2 pCi/L.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Uranium-Total		*ND	pCi/L	0.2	EPA 908.1	9/7/2004	ELI

Michael Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report or any future analytical needs, please contact: **Michael Moore**

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Lab Federal ID#:	WY00002	Lab Sample	0428002
Date Lab Rec'd Sample:	8/20/2004	Date Reported by Lab:	09/15/04
Compliance Sample:	X Yes ☐ No	Replacement Sample	☐
Collection Date:	8/19/2004	Time Collected:	20:30
Sample Type:	☐ CO-confirmation ☐ RP-repeat		
	X RT-routine ☐ DU-duplicate ☐ SP-special ☐ Other		
PWS #:		PWS Name:	S P F WATER ENGINEERING, LLC
Sampling Point/Location	SPRING VALLEY RANCH SUR-10	Tag # / Facility ID:	
Collector's Name:	C FEAST	Contact Phone #:	(208) 383-4140

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

PUBLIC DRINKING WATER SYSTEM RADIOLOGICAL ANALYSIS REPORT

FRDS Number	CONTAMINANT	Result ug/L	Result pCi/L	MCL	Analysis Date	Analyst	Method
4002	**Gross Alpha Activity** *(Includes Radium and Uranium)*		--				
4006	**Uranium** (measure if gross alpha exceeds 15 pCi/L; activity = 1.0 x concentration ug/L	*ND	*ND	30	9/7/2004	ELI	EPA 908.1
4000	**Adjusted Gross Alpha** (Subtract Uranium activity level from Gross Alpha Activity above)		--				
4020	**Radium-226** *(Required if Alpha activity is greater than 5pCi/L)*		--				
4030	**Radium-228** (measure if radium 226 exceeds 3 pCi/L)		--				
4010	**Total Measured Radium** (Sum of Ra-226 and Ra-228)		--				
4100	**Beta/Photon Activity** *(Measure major constituents if activity exceeds 50 pCi/L)*		--				

Michael Moore 9/29/04
Lab Supervisor's Signature Date

ND = Not detected within sensitivity of instrument
-- = No analysis performed for this contaminant

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 09/22/04.
*ND=NONE DETECTED @ 0.2 pCi/L.

Attn: TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

CC:

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0428003

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: C FEAST
Submitted By: C FEAST

Source of Sample:
PROJECT: SPRING VALLEY RANCH SUR-10

Time of Collection: 20:30
Date of Collection: 8/19/2004
Date Received: 8/20/2004
Report Date: 9/22/2004

PWS:

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 09/22/04.
*ND=NONE DETECTED @ 0.2 pCi/L. **ND=NONE DETECTED @ 1.0 pCi/L.

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Radium 226		*ND	pCi/L	0.2	EPA 903.0	8/25/2004	ELI
Radium 228		**ND	pCi/L	1	EPA 904.0	8/31/2004	ELI

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: **Michael Moore**

Lab Federal ID#: **WY00002**	Lab Sample **0428003**
Date Lab Rec'd Sample: 8/20/2004	Date Reported by Lab: 09/13/04
Compliance Sample: [X] Yes [ ] No	Replacement Sample [ ]
Collection Date: 8/19/2004	Time Collected: 20:30
Sample Type: [ ] CO-confirmation [ ] RP-repeat [X] RT-routine [ ] DU-duplicate [ ] SP-special [ ] Other	
PWS #:	PWS Name: S P F WATER ENGINEERING, LLC
Sampling Point/Location: SPRING VALLEY RANCH SUR-10	Tag # / Facility ID:
Collector's Name: C FEAST	Contact Phone #: (208) 383-4140

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

PUBLIC DRINKING WATER SYSTEM RADIOLOGICAL ANALYSIS REPORT

FRDS Number	CONTAMINANT	Result ug/L	Result pCi/L	MCL	Analysis Date	Analyst	Method
4002	**Gross Alpha Activity** *(Includes Radium and Uranium)*	[redacted]	--	[redacted]			
4006	**Uranium** (measure if gross alpha exceeds 15 pCi/L; activity = 1.0 x concentration ug/L	--	--				
4000	**Adjusted Gross Alpha** (Subtract Uranium activity level from Gross Alpha Activity above)	[redacted]	--		[redacted]		
4020	**Radium-226** *(Required if Alpha activity is greater than 5pCi/L)*	[redacted]	*ND	[redacted]	8/25/2004	ELI	EPA 903.0
4030	**Radium-228** (measure if radium 226 exceeds 3 pCi/L)	[redacted]	**ND	[redacted]	8/31/2004	ELI	EPA 904.0
4010	**Total Measured Radium** (Sum of Ra-226 and Ra-228)	[redacted]	--		[redacted]		
4100	**Beta/Photon Activity** *(Measure major constituents if activity exceeds 50 pCi/L)*	[redacted]	--				

Michael D. Heath 9/24/04
Lab Supervisor's Signature Date

ND = Not detected within sensitivity of instrument
-- = No analysis performed for this contaminant

ELI-TESTING PERFORMED AT ENERGY LABORATORIES, INC. RESULTS RECEIVED 09/22/04.
*ND=NONE DETECTED @ 0.2 pCi/L. **ND=NONE DETECTED @ 1.0 pCi/L.

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

CC:

10E

Printed 05/24/2004
Drilling Permit No. 815597
Well Tag No. D0031493
Well ID # 386275
Water Right No.
Receipt # W031747
Approved Date 05/25/2004

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
DRILLING PERMIT

Relationship: Applicant
Name: SUNCOR
Address: 485 EAST RIVERSIDE DR SUITE 300
EAGLE ID 83616

Phone: (208)939-0343

Proposed Well Location: Township 05N, Range 01E, Section 8, SW, SW
COUNTY ADA TEST WELL #10

Street Address of Well Site: 1/2 MILE NE OF WILLOW CREEK RD
EAGLE ID

Proposed Use of Well: Test

Well Construction Information:

A. New Well
B. Proposed Surface Diameter: 8 Inches. Proposed Depth 800 Feet.
C. Anticipated Bottom Hole Temperature: 85F and less

Construction Start Date: Jun 01 2004

Anticipated Well Drilling Company: ADAMSON PUMP & DRILLING (No. 457)

Applicant's Signature: See original application Date _____

Title: _____

Well ID # 386275

Well Tag No. D0031493

ACTION OF THE DEPARTMENT OF WATER RESOURCES

This permit is Approved on Tuesday, May 25, 2004.

1. This drilling permit is valid for two (2) months from the approval date for the start of construction and is valid for one (1) year from the approval date for completion of the well unless an extension has been granted.
2. This permit does not constitute an approval of the local Health District or the Idaho Department of Environmental Quality which may be required prior to construction of this well. The local Health District should be contacted for septic tank/drainfield locations. Domestic wells must not be drilled closer than 100 ft. from any drainfield and 50 ft. from any septic tank. Public Water Supply wells must not be drilled closer than 100 ft. from any drainfield or septic tank.
3. The well shall be constructed by a driller currently licensed in the state of Idaho who must maintain a copy of the drilling permit at the drilling site.
4. Approval of this drilling permit does not authorize trespass on the land of another party.
5. This permit does not constitute other local, county, state or federal approvals that may be required for construction of a well.
6. This drilling permit does not represent a right to divert and use the water of the State of Idaho. If the well being drilled is associated with approved water rights(s) use of the well must comply with conditions of said water right(s).
7. If a bottom hole temperature of 85 Degrees F (29.44 oC) or greater is encountered, well construction shall cease and the well driller and the well owner shall contact the Department of Water Resources immediately.
8. Idaho Code, S 55-2201 - 55-2210 requires the applicant and/or its contractors to contact "Dig-line" (Dig-Line is a one-call center for utility notification) not less than 2 working days prior to the start of any excavation for this project. The "Dig-Line " Number for this location is 1-800-342-1585
9. Please be advised that this drilling permit should be considered and treated as a preliminary permit. If you are in disagreement with this preliminary permit you have fourteen (14) days of the service date of this permit to petition the Idaho Department of Water Resources for reconsideration, pursuant to Section 67-5243, Idaho Code.
10. The well tag for the drilling permit/start card shall be securely and permanently attached to the well casing through welding or by the use of four closed end domed stainless steel pop rivets. The tag attachment will be done at the time of completion of the well, and prior to removing the drill rig from the drill site.
11. This drilling permit has been approved for construction or drilling of an exploratory well intended to be used for collecting geologic, hydrologic or water quality data.
12. No water shall be produced from this well or any fluid injected into this well without specific written authorization from the Department.
13. Any surface casing installed in this well shall not exceed 8 inches nominal diameter.
14. All casing strings installed in this well shall be sealed their entire length with approved seal material and by positive means of placement unless otherwise authorized by this drilling permit.
15. A drilling prospectus including a schematic diagram and construction narrative describing all pertinent features of the well including drilling methods, seal material and placement methods, casing schedules and specifications shall be submitted for review by the Department and attached to this drilling permit prior to the start of construction.

16. No casing installed in this well shall be drilled and driven through multiple aquifers, unless it is completely removed and the borehole is properly sealed or the casing is perforated at appropriate intervals and pressure grouted with approved grout. Drilling and driving casing may be allowed above the water table or where multiple aquifers are not encountered provided that the casing is sealed as required by administrative rules.
17. This well shall be properly plugged in accordance with a plan approved by the department at least 30 days prior to the expiration of the bond.
18. The bond secured for abandonment of this well shall be valid for the entire time the well remains open. The Department will give the well owner 60 days notice prior to the expiration of the bond that the well must be properly plugged. If the well owner has not properly plugged the well at least 30 days prior to he expiration of the bond, the Director may commence action to attached the bond and hire a licensed driller to properly plug the well.
19. Drilling of this well shall not commence until the Department has received a document from the surety company or bank stating that the bond is in full force and effect and the Department has determined the amount of the bond is sufficient.
20. This drilling permit is not valid unless the well owner has secured a bond in favor of the Director in an amount sufficient for proper plugging and abandonment of the well. The bond shall remain in effect and accessible by the Director until this well is plugged. The bond amount for this well shall be at least $7,200.

Signature of Authorized Dept Representative

Sr WR Agent
Title

Appendix E
Geologic Cross Section Well Logs

Form 238-7
1/94

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ball Point Pen

092975

1. DRILLING PERMIT NO. 65-94-W-0142-000
Other IDWR No.

2. OWNER:
Name Stover Love
Address 507 W. 12th.
City Emmett State Id Zip 83617

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 18, NE 1/4 (10 acres) NW 1/4 (40 acres) 1/4 (160 acres)
Gov't Lot ____ County Gem

Address of Well Site same
City Emmett
(Give at least name of road + Distance to Road or Landmark)

Lt. ____ Blk. ____ Sub. Name ____

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK
☐ New Well ☐ Modify or Repair ☒ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☒ Cable ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bent.	0	20	200	Pour

Was drive shoe used? Y ☐ N ☐
Was drive shoe seal tested? Y ☐ N ☒ How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6	+1	72	.250	Steel	☐	☐	☒	☐
5	67	72	.258	Steel	☐	☐	☒	☐
5	77	79	.258	Steel	☐	☐	☒	☐

Length of Headpipe 4' 8" Length of Tailpipe 2'

9. PERFORATIONS/SCREENS
☐ Perforations Method
☒ Screens Screen Type 304 Stainless

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
72	77	.020		5		☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
12 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: Well Seal

11. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
70			1

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
6	0	2	Top Soil		X
	2	22	Gravel		X
	22	32	Gravel	X	
	32	33	Clay		X
	33	67	Course SAND	X	
	67	77	Blue SAND	X	
	77	79	Blue Clay		X

RECEIVED
SEP 15 1994
Department of Water Resources

RECEIVED
JUN 17 1994
WATER RESOURCES
WESTERN REGION

FEB 09 1995

Completed Depth 79 (Measurable)
Date: Started May 19, 1994 Completed 5-20-94

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Dennis Phipps Well Drill Firm No 332
Firm Official [signature] Date 6-14-94
and
Supervisor or Operator [signature] Date 6/14/94
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

057561

Form 238-7
3/95

C C

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

RECEIVED
OCT 0 8 1996
WATER RESOURCES
WESTERN REGION

1 of 3

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 65-96-W-0167-000
Other IDWR No. _____

2. OWNER: Case Hauson
Name GEM Co BOARD of COMMISSIONERS
Address 411 THIRD STREET SO
City NAMPA State ID Zip 83651

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ✱ or South ☐
Rge. 1 East ☐ or West ✱
Sec. 28, NE 1/4 (10 acres) NE 1/4 (40 acres) W 1/4 (160 acres)
Gov't Lot ____ County _____
Lat: : : Long: : :
Address of Well Site JACK ASS GULCH RD (TRANSFER STN)
(Give at least name of road + Distance to Road or Landmark)
City EMMETT

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
✱ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
✱ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
✱ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
BENTONITE	0	18	900#	OVER BORE

Was drive shoe used? ✱Y ☐N Shoe Depth(s) _____
Was drive shoe seal tested? ☐Y ☐N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8	+2	920	.25	STEEL	✱	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

9. PERFORATIONS/SCREENS
☐ Perforations Method _____
☐ Screens Screen Type _____

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OCT 28 1996
Department of Water Resources

From	To	Slot Size	Number	Diameter	Material
NONE					

Casing ☐ ☐ Liner ☐ ☐ ☐ ☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
690 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:
☐ Pump ☐ Bailer ✱ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
40			4 HRS

Water Temp. 72° Bottom hole temp. _____
Water Quality test or comments: 10 IRON / 7.5 PH / 15 GRNS
Depth first Water Encountered 181

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	1	TOP SOIL - GRAVEL		
	1	16	DK BROWN CLAY - VERY HARD		
	16	18	SAND		
8	18	52	SANDY CLAY - SOFT		
	52	65	SAND - COARSE		
	65	72	CLAY		
	72	120	SAND - COARSE		
	120	121	CLAY		
	121	124	SAND - COARSE		
	124	125	CLAY		
	125	140	SAND W/CLAY PCS - SAME		
	140	147	SANDY CLAY - "		
	147	158	CLAY		
	158	162	SAND - SAME		
	162	168	CLAY		
	168	177	SAND & CLAY STREAKS		
	177	181	SANDY CLAY		
	181	188	SAND - COARSE	✱	
	188	194	SANDY CLAY - COARSE		
	194	201	CLAY		
	201	204	SANDY CLAY		
	204	214	SAND	✱	
	214	242	CLAY		
	242	244	SAND - SAME		
	244	262	CLAY		
	262	266	SAND - SAME		
	266	277	SAND CLAY		
	277	287	CLAY		
	287	290	SAND - SAME		
	290	300	CLAY - SANDY		
	300	305	CLAY - HARD		
	305	308	SAND		
			CONTINUED		

MICROFILMED OCT 16 1996

Completed Depth 945 (Measurable)
Date: Started 7-1-96 Completed 7-15-96

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name ADAMSON PUMP & DRILLING Firm No. 0457
Firm Official Dave Adamson Date 8-20-96
and
Supervisor or Operator W Bill Jaime Date _____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

C

Pg 2 of 3

Form 238-7
3/95

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

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OCT 0 8 1996
WATER RESOURCES WESTERN REGION

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____1/4 ____1/4 ____1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 65-96-W-0167-000
Other IDWR No. _____

2. OWNER:
Name GEM Co BOARD of Commiss
Address _____
City _____ State ____ Zip ____

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 6 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 28, ____ 1/4 (10 acres) ____ 1/4 (40 acres) ____ 1/4 (160 acres)
Gov't Lot ____ County _____
Lat: : : Long: : :
Address of Well Site _____
_____ City _____
(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☐ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) _____
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____

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Department of Water Resources

9. PERFORATIONS/SCREENS
☐ Perforations Method _____
☐ Screens Screen Type _____

From	To	Slot Size	Number	Diameter	Material		
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
_____ ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____
_____ Depth first Water Encountered _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	308	317	CLAY		
	317	333	BLUE CLAY		
	333	342	SAND CLAY - SUPER SOFT		
	342	375	SAND - COARSE		
	375	381	SANDY CLAY		
	381	387	SAND		
	387	393	CLAY		
	393	403	BLUE CLAY		
	403	422	BROWN COARSE SAND & BLUE CLAY Mix		
	422	424	BROWN CLAY		
	424	434	SAND - COARSE		
	434	436	CLAY		
	436	442	SAND - COARSE		
	442	455	CLAY		
	455	462	SAND / CLAY		
	462	464	~~GRAY~~ SAND		
	464	470	~~SAND~~ CLAY		
	470	480	~~CLAY~~ SAND		
	480	490	~~SAND~~ SAND-CLAY		
	490	498	SANDY ~~CLAY~~ BLUE CLAY		
	498	520	SAND W/SMALL CLAY LAYERS	45	COARSE 2-3
	520	522	CLAY		
	522	532	SAND		
	532	534	CLAY		
	534	552	SAND		
	552	570	SANDY CLAY		
	570	580	SAND - FINER BUT COARSE		
	580	581	CLAY		
	581	594	SANDY CLAY		
	594	602	CLAY		
	602	642	SAND - CLAY		
	642	700	SANDY CLAY		
			CONTINUED		

MICROFILMED
DEC 0 6 1996

Completed Depth _____ (Measurable)
Date: Started _____ Completed _____

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Addison Pump & Drilling Firm No. 457
Firm Official Dave Addison Date 8-26-96
and
Supervisor or Operator WD Bill Tanner Date _____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

C

057565 PG 3 of 3

Form 238-7
3/95

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Use Typewriter or Ballpoint Pen

RECEIVED OCT 08 1996 WATER RESOURCES WESTERN REGION

Office Use Only
Inspected by ____
Twp____ Rge____ Sec____
____1/4 ____1/4 ____1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 65-96 W.0167.000

Other IDWR No.

2. OWNER:
Name GEM Co BOARD OF COMMISSIONERS
Address
City State Zip

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

Twp. 6 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 28, ____1/4 ____1/4 ____1/4 (10 acres, 40 acres, 160 acres)
Gov't Lot ____ County ____
Lat: : : Long: : :
Address of Well Site ____
____ City ____
(Give at least name of road + Distance to Road or Landmark)

Lt.____ Blk.____ Sub. Name____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other____

5. TYPE OF WORK check all that apply (Replacement etc.)
☐ New Well ☐ Modify ☐ Abandonment ☐ Other____

6. DRILL METHOD
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s)____
Was drive shoe seal tested? ☐ Y ☐ N How?____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe____ Length of Tailpipe____

9. PERFORATIONS/SCREENS
☐ Perforations Method____
☐ Screens Screen Type____

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
						☐	☐
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
____ft. below ground Artesian pressure ____lb.
Depth flow encountered ____ft. Describe access port or control devices:____

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp.____ Bottom hole temp.____
Water Quality test or comments:____
Depth first Water Encountered____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	700	714	BLUE CLAY		
	714	724	SAND		
	724	739	SANDY CLAY		
	739	782	SANDY CLAY - MOSTLY SAND		
	782	786	SAND		
	786	794	CLAY		
	794	806	SAND		
	806	822	SANDY CLAY	✱	5-7
	822	840	COARSE SAND ; BLUE CLAY		
	840	844	SAND	✱	15-20
	844	865	BLUE CLAY		
	865	872	SAND	✱	10-15
	872	890	BLUE CLAY		
	890	913	SAND	✱	15
	913	933	BLUE CLAY		
	933	945	SAND - COARSE	✱	40-45

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MICROFILMED DEC 06 1996

Completed Depth____(Measurable)
Date: Started____ Completed____

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Arrowhead Pump & Drilling Firm No. 457

Firm Official Dave Adamson Date 8-26-96

and

Supervisor or Operator W D B[illegible] Date
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

6/93

NOV 18 1993

WATER RESOURCES
WESTERN REGION

WELL DRILLER'S REPORT

Ball Point Pen

NOV 15 1993

Department of Water Resources

1. DRILLING PERMIT NO. 63-93-W-0619-000

Other IDWR No. _____

2. OWNER:

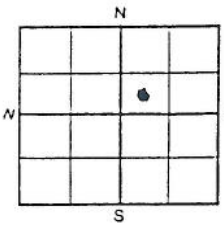
Name MARK LYNN

Address 6500 CHAPPARRAL

City EAGLE State ID Zip 83616

3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.



T. 5N North ☒ or South ☐

R. 1W East ☐ or West ☒

Sec. 3, _____ 1/4 (10 acres) SE 1/4 (40 acres) NE 1/4 (160 acres)

Gov't Lot _____ County CANYON

Address of Well Site 6500 CHAPPARRAL, EAGLE, ID.

(Give at least Direction + Distance to Road or Landmark)

Lot No. _____ Block No. _____ Subd. Name _____

4. PROPOSED USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation

☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK

☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD

☐ Mud Rotary ☒ Air Rotary ☒ Cable ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
BENT & CEMENT	200	170		POURED
CEMENT & BENT	170	150		PUMPED
BENT & CEMENT	150	140		POURED
SURFACE SEAL AROUND 12" TO 20'				

Was drive shoe seal tested? Y☐ N☒ How? _____

8. CASING/LINER:

Diameter	From	To	Guage	Casing	Liner	Steel	Plastic	Welded	Threaded
12	+1	79	250	X		☒	☐	☒	☐
8	+2	551	250	X		☒	☐	☒	☐
6	523	543				☐	☐	☐	☐
6	573	623				☐	☐	☐	☐

Final location of shoes 551

Top Packer or Headpipe 523 Bottom Tailpipe 623

9. PERFORATIONS/SCREENS

☐ Perforations Method _____

☒ Screens Type 304 Material STAINLESS

From	To	Slot Size	Number	Diameter	Tele/Pipe Size	Casting	Liner
543	563	.040		6	PIPE	☐	☒
563	573	.030		6	PIPE	☐	☒
						☐	☐
						☐	☐

10. WELL TESTS:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Depth	Time
NO TEST			

Temperature of water _____ Was a water analysis done? Yes ☐ No ☐

By whom? _____

Water Quality (odor, etc.) _____

Bottom Hole Temperature _____

11. STATIC WATER LEVEL:

395 ft. below surface Depth artesian flow found _____

Artesian pressure _____ lb. Describe access port _____

Describe Controlling Devices: _____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	GPM	SV
14	0	5	TOP SOIL		
14	5	25	SAND & GRAVEL		
12	25	40	SANDY YELLOW CLAY		
12	40	60	SANDSTONE		
12	60	79	LOOSE SAND		
12	79	180	SANDSTONE		
12	180	235	COURSE SAND		
8	235	240	SANDSTONE		
8	240	250	SAND & PEA GRAVEL		
8	250	300	SANDSTONE		
8	300	320	SANDY BROWN CLAY		
8	320	340	SANDSTONE		
8	340	350	SANDY BROWN CLAY		
8	350	380	SANDSTONE		
8	380	385	SAND		
8	385	400	SANDSTONE		
8	400	410	SAND & GRAVEL		
8	410	440	SANDSTONE		
8	440	450	BROWN SAND	?	39
8	450	480	SANDSTONE		39
8	480	485	FINE SAND		39
8	485	540	BLACK SANDSTONE		39
8	540	550	COURSE SAND		39
8	550	570	COURSE SAND & GRAVEL		39
8	570	590	COURSE SAND		39
8	590	600	COURSE BROWN SAND		39
8	600	620	BROWN SAND		39

Date: Started 7-10-93 Completed 10-18-93

13. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name BILL DOTY DRILLING CO., INC. Firm No. 42

Firm Official _____ Date 11-1-93

and

Supervisor or Operator _____ Date 11-1-93

(Sign once if Firm Official & Operator)

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No. 809803
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. **WELL TAG NO.** D 0030892
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. **OWNER:**
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. **LOCATION OF WELL by legal description:**
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 1/4 (10 acres) SE 1/4 (40 acres) NW 1/4 (160 acres)
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 1 mile SW of Willow Creek Rd
Big Gulch (Closest Road, name of road + Distance to Road or Landmark) City Eagle
Lt. ____ Blk: ____ Sub. Name ____

4. **USE:**
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. **TYPE OF WORK** check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. **DRILL METHOD:**
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. **SEALING PROCEDURES**

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	105	3150 #	overbore

Was drive shoe used? ☒Y ☐N Shoe Depth(s) 738'
Was drive shoe seal tested? ☐Y ☒N How?

8. **CASING/LINER:**

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	738'	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐Y ☐N Type ____

9. **PERFORATIONS/SCREENS PACKER TYPE**
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 PERFS
Screen Type & Method of Installation None PER ROW

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
560	580	1/4	360	8"	.250 WALL	☒	☐
580	600	1/4	360	8"	CASING	☒	☐
600	620	1/4	360	8"	"	☒	☐
620-640		1/4	360	8"	"	☒	

Filter Material	From	To	Weight / Volume	Placement Method
Continued on page 2				

11. **STATIC WATER LEVEL OR ARTESIAN PRESSURE:**
455 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices:
Steel plate

12. **WELL TESTS:**
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
175			6 hours

Water Temp. 80° Bottom hole temp. ____
Water Quality test or comments: Iron .5 PH 7.5
Grams 2 Depth first Water Encounter 590'

13. **LITHOLOGIC LOG:** (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	10	sandy soil		
"	10	96	tan clay		
"	96	105	blue clay		
8	105	134	blue clay		
"	134	140	tan clay		
"	140	195	pea gravel & clay		
"	195	360	L gray sand & clay		
"	360	367	coarse sand & clay like pea gravel		
"	367	505	Fine & coarse sand		
"	505	540	larger pea gravel		
"	540	590	pea gravel w/ large sand quartz		
"	590	595	quartz sand	X	
"	595	605	Finer tan sand		
"	605	620	quartz sand	X	
"	620	640	Finer sand	X	
"	640	645	quartz sand	X	
"	645	655	quartz sand & some pea gravel	X	
"	655	660	gravel & quartz sand	X	
"	660	670	big sand		
"	670	680	big sand	X	
"	680	685	big sand		
"	685	690	big sand	X	
"	690	730	big sand	X	
"	730	740	big sand	X	
			Due to heaving sand - a mixture of sand & cement was placed from 730' to 740'		

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MAR 19 2004
WATER RESOURCES (Measurable)
WESTERN REGION

Completed Depth 730' Completed
Date: Started 01-26-04 Completed 02-27-04

14. **DRILLER'S CERTIFICATION**
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Adamson Pump & Drilling Rig No. 457
Principal Driller Dave Adamson Date 3.15.04
and
Driller or Operator II Dave Adamson Date 3.15.04
Operator I ____ Date ____
Principal Driller and Rig Operator *Required*.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No.
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0030892 pg 2
DRILLING PERMIT NO.
Water Right or Injection Well No.

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 ____ 1/4 SE 1/4 NW 1/4
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 1 mile SW of Willow Creek Rd
Big Gulch City Eagle
(3 mi. & left name of road – 5 miles to Reed or Landmark)
Lt. ____ Blk. ____ Sub. Name

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method

Was drive shoe used? ☐Y ☐N Shoe Depth(s)
Was drive shoe seal tested? ☐Y ☐N How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe Length of Tailpipe
Packer ☐Y ☐N Type

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 DEGREES
Screen Type & Method of Installation PER ROW (360)

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
640	660	1/4	360	8"	.250 WALL	☒	☐
660	680	1/4	360	8"	CASING	☒	☐
680	700	1/4	360	8"	3/8	☒	☐
700	720	1/4	360	8"	3/8	X	

Filter Material	From	To	Weight / Volume	Placement Method
720 - 730				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
____ft. below ground Artesian pressure ____lb.
Depth flow encountered ____ft. Describe access port or control devices:

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. Bottom hole temp.
Water Quality test or comments:
Depth first Water Encounter

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N

Completed Depth (Measurable)
Date: Started Completed

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Adamson Pump & Drilling Firm No. 457
Principal Driller Dave Adamson Date 3-15-04
and
Driller or Operator II Dave Adamson Date 3-15-04
Operator I Date
Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6.02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No.
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0031492
DRILLING PERMIT NO. 815596
Water Right or Injection Well No. 386274

2. OWNER:
Name SUNCOR
Address 485 E. Riverside Dr. #300
City Eagle State ID Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North XX or South ☐
Rge. 1 East XX or West ☐
Sec. 9 ____ 1/4 S/W 1/4 N/E 1/4
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site ½ mile SW of Willow Creek Rd
City Eagle
Give at least one - Distance to Road or Landmark
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection XX Other test #9

5. TYPE OF WORK check all that apply (Replacement etc.)
XX New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable XX Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
bentonite grout	806	265	1250 gal	pumped
bentonite grout	215	0	300 gal	pumped

Was drive shoe used? ☐ Y ☐ N Shoe Depth(s) ____
Was drive shoe seal tested? ☐ Y ☐ N How? ____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	235	250	steel	XX	☐	XX	☐
6"	245	253	250	steel	XX	☐	XX	☐
					☐	☐	☐	☐

Length of Headpipe +2 Length of Tailpipe 0
Packer ☐ Y ☐ N Type ____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method ____
Screen Type & Method of Installation stainless

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
235	245	30		6"	stnls	XX	☐
253	263	30		6"	stnls	XX	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
#8-12 sand			3000#	

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
193'4" ft. below ground Artesian pressure ____ lb.
Depth flow encountered 198 ft. Describe access port or control devices: ____

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian XX

Yield gal./min.	Drawdown	Pumping Level	Time
43	14'	207	4½hr

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	10	topsoil, sandy clay		X
	10	27	sand, brown clay		X
	27	60	tan gray clay		X
	60	90	sandy brown clay w/ gray streaks		X
	90	104	gray clay		X
	104	110	sandy brown clay		X
	110	155	coarse sand w/ gray streaks		X
	155	198	coarse to medium sand w/ clay streaks	X	
				X	
	198	210	reddish sand	X	
	210	243	fine sand w/ clay streaks	X	
	243	265	sand w/ wood, clay streaks	X	
	265	430	silty gray blue clay		X
	430	530	sticky gray blue clay		X
	530	531	hard shale		X
	531	780	gray blue clay		X
	780	781	hard shale		X
	781	806	gray blue clay		X
			topped with chips 20 sks		

Completed Depth 806 drilled, 263 cased (Measurabl
Date: Started 6/ /04 Completed 6/25/04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Stevens & Sons Firm No. 153
Principal Driller ____ Date 6/28/0
and
Driller or Operator II ____ Date ____
Operator I ____ Date ____
Principal Driller and Rig Operator Required.
Operator I must have signature of Driller/Operator II.

IDAHO WATER RESOURCES

Form 238-7
7/94

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

RECEIVED
AUG 2 2 1995
WATER RESOURCES
WESTERN REGION

Use Typewriter or Ball Point Pen

1. DRILLING PERMIT NO. 63-95-W-0611-000
Other IDWR No.

2. OWNER:
Name HOLMES LYNOT
Address P.O. Box 45164
City BOISE State ID Zip ~~83707~~ 83711-5164

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 5 North ☒ or South ☐
Rge. 1 East ☒ or West ☐
Sec. 29, ____ 1/4 NE 1/4 SW 1/4
(10 acres / 40 acres / 160 acres)
Gov't Lot ____ County ADA

Address of Well Site
City ~~ADA~~ EAGLE
(Give at least name of road + Distance to Road or Landmark)

Lt. 7 Blk. 1 Sub. Name STILLWELL ESTATE #7

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK
☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☐ Cable ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
BENTONITE	0	18	300 lbs	OVERDRILL

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s)
Was drive shoe seal tested? Y☐ N☐ How?

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	1½	239	.25	STEEL	☒	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe 5' Length of Tailpipe 1'

9. PERFORATIONS/SCREENS
☐ Perforations Method WASH-IN
☒ Screens Screen Type STAINLESS STEEL

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
~~[illegible]~~	~~[illegible]~~	.20				☐	☐
241	251	.20	—	5"	ST STEEL	☐	☒
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
141 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices:

11. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
40	—	235	1 HR

Water Temp. 54° Bottom hole temp. 54°
Water Quality test or comments:

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
8	0	2	TOP SOIL		
	2	18	BRN CLAY		
6	18	67	BRN CLAY		
	67	76	BRN SANDY CLAY		
	76	115	BRN SAND		
	115	155	BRN CLAY		
	155	161	SAND		
	161	173	BRN CLAY		
	173	181	FINE SAND		
	181	183	BRN CLAY		
	183	184	FINE SAND		
	184	186	HARD BROWN CLAY		
	186	197	SANDY CLAY		
	197	201	ORANGE SAND		
	201	203	TAN CLAY		
	203	207	SAND W/CLAY STRINGERS		
	207	218	SAND		
	218	223	TAN CLAY		
	223	227	FINE SAND		
	227	237	COARSE SAND		
	237	238	TAN CLAY		
	238	252	SAND		

Completed Depth 252 FT. (Measurable)
Date: Started 8-9-95 Completed 8-16-95

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name COGNSE WELL Drilling Firm No. 409
Firm Official Gary E. Cognse Date 8-16-95
and
Supervisor or Operator Date

1. WELL OWNER

Name WILLOW BROOK WATER CORP.

Address PEARL ROUTE EAGLE, ID 83616

Drilling Permit No. 83-92-W-032

Water Right Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase
☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

3. PROPOSED USE

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☒ Other GRAVEL CHUTE (specify type)

4. METHOD DRILLED

☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	6 inches	+ 2.5 feet	237.5 feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

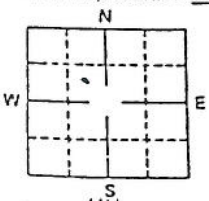
Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer's name _____
Type _____ Model No. _____
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet
Surface seal depth 20' Material used in seal: ☐ Cement grout
☒ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing
☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name _____

Lot No. _____ Block No. _____

County ADA

SE ¼ NW ¼ Sec. 17, T. 5 N ☒ S ☐ R. 1 E ☐ W ☒

7. WATER LEVEL

Static water level 150 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA

☒ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
30 GAL	325'	½ HR.

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
8	0	20	SAND		X
6	20	100	SAND, SOME CLAY		X
6	100	160	CLAY WITH SAND SEAMS		X
6	160	200	SAND	X	
6	200	210	BLUE CLAY		X
6	210	280	SAND WITH SOME CLAY STINGERS	X	
6	280	310	COURSE SAND WITH PEA GRAVEL	X	
6	310	318	CLAY (SANDY WITH PEA GRAVEL)		X
6	318	340	SAND		

RECEIVED
JUL 22 1992
Department of Water Resources

SHIPPED FEB 03 1992

10.

Work started 1-9-92 finished 1-14-92

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

BILL DOTY
Firm Name DRILLING CO., INC. Firm No. 42
106 CALLOWAY
Address CALDWELL, ID. Date 1-31-92
83605
Signed by (Firm Official) _____
and
(Operator) _____

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

WELL OWNER
Name CHAPARELL WATER USERS ASSN.
Address P.O. BOX 507 EAGLE ID 83616
Drilling Permit No. 63-91-W-088
Water Right Permit No. 63-07700

NATURE OF WORK
REPLACEMENT
[ ] New well ☐ Deepened ☐ Replacement
[ ] Well diameter increase
[ ] Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)

PROPOSED USE
IRRIGATION
[ ] Domestic ☐ Irrigation ☐ Test ☐ Municipal
[ ] Industrial ☐ Stock ☐ Waste Disposal or Injection
[ ] Other _____ (specify type)

METHOD DRILLED
REVERSE ROTARY
[ ] Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
[ ] Cable ☐ Dug ☐ Other _____

WELL CONSTRUCTION
SEE ATTACHED
Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
_____ inches	_____ inches +	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☒ Yes ☐ No
Manufacturer's name ROSCOE MOSS
Type CONTINOUS WIRE Model No. HEAVY
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Diameter ___ Slot size ___ Set from ___ feet to ___ feet
Gravel packed? ☒ Yes ☐ No ☐ Size of gravel 3/8
Placed from 425 feet to 110 feet
Surface seal depth 110 Material used in seal: ☐ Cement grout ☐ Bentonite ☒ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port 2" PIPE

7. WATER LEVEL
Static water level 157 feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA
NOT AVAILABLE
☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

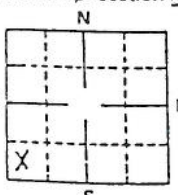
9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
29					
	0	5	TOPSOIL		X
	5	10	SANDY LOAM		X
	10	13	SAND & GRAVEL		X
	13	25	SAND W/ CLAY STREAKS		X
	25	55	FINE TO COARSE SAND		X
	55	65	FINE TO MED. SAND		X
	65	85	COARSE SAND		X
	85	91	BROWN CLAY		X
	91	105	MEDIUM SAND		X
	105	155	COARSE SAND		X
	155	175	BROWN CLAY		X
	175	213	GRAY CLAY		X
	213	215	BROWN CLAY		X
	215	225	COARSE GOLDEN SAND	X	
	225	235	COARSE SAND & PEA GRV.	X	
	235	265	FINE TO CRSE SAND	X	
	265	269	LITE BRN CLAY		X
	269	425	COARSE SAND & PEA GRV.	X	

RECEIVED
SEP 9 1991
Department of Water Resources
Western Regional Office

10.
Work started 9/4/91 finished 9/14/91

LOCATION OF WELL
Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County ADA
SW SW 9 3N N ☐ S ☐ 1W E ☐ W ☐
___ ¼ ___ ¼ Sec. ___, T. ___ R. ___

11. DRILLERS CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name PETE COPE DRILLING Firm No. 213
Address 6505 W CHINDEN Date 9/9/91
Signed by (Firm Official) Joseph Jones
and
(Operator) Joseph Jones

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Chaparell Water users Assn.
P.O. Box 507
Eagle ID 83616
Permit# 63-91-w-088

"16"casing record .250 wall welded

1	-	285	286
305	-	325	20
335	-	350	15
360	-	375	15
385	-	395	10
415	-	425	10
			356 total casing

16" Screen record .40 slot Roscoe Moss Continous wire.

285	-	305	20
325	-	335	10
350	-	360	10
375	-	385	10
395	-	415	20
			70 total screen
			426 total screen+casing

FEB 1 1967
Department of Reclamation

REPORT OF WELL DRILLER
State of Idaho

State law requires that this report shall be filed with the State Reclamation Engineer within 30 days after completion or abandonment of the well.

WELL OWNER:
Name Bill Leach
Address Star, Willow Creek Road, Hwy. #16

Owner's Permit No. [illegible]
NATURE OF WORK (check): Replacement well [x] New well [X] Deepened [ ] Abandoned [ ]
Water is to be used for: Domes, & Irrigation
METHOD OF CONSTRUCTION: Rotary [ ] Cable [x] Dug [ ] Other ______ (explain)
CASING SCHEDULE: Threaded ___ Welded x
8in. "Diam. from 0 ft. to 390 ft.
"Diam. from ___ ft. to ___ ft.
"Diam. from ___ ft. to ___ ft.
"Diam. from ___ ft. to ___ ft.
Thickness of casing: .250 in Material:
Steel [x] concrete [ ] wood [ ] other [ ]
(explain)
PERFORATED? Yes [ ] No [x] Type of perforator used:
Size of perforations: ___" by ___"
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
___ perforations from ___ ft. to ___ ft.
WAS SCREEN INSTALLED? Yes [ ] No [x]
Manufacturer's name
Type ___ Model No. ___
Diam. ___ Slot size ___ Set from ___ ft. to ___ ft.
Diam. ___ Slot size ___ Set from ___ ft. to ___ ft.
CONSTRUCTION: Well gravel packed? Yes [ ] No. [X] size of gravel ___ Gravel placed from ___ ft. to ___ ft. Surface seal provided? Yes [ ] No [ ] To what depth? ___ ft. Material used in seal: Cased through clay
Did any strata contain unusable water? Yes [ ] No. [X] Type of water: ___
Depth of strata ___ ft. Method of sealing strata off: ___

Surface casing used? Yes [x] No. [ ]
Cemented in place? Yes [ ] No [X]

Locate well in section

Sec.

LOCATION OF WELL: County Ada
s e ¼ ~~N W~~ ¼ Sec. [illegible] T. 5 N/S R. 1 E/W
[illegible]

Size of drilled hole: 8in. Total depth of well: 450 ft. Standing water level below ground: 300 ft. Temp. Fahr. 85 ° Test delivery: ___ gpm or ___ cfs Pump? [ ] Bail [ ]
Size of pump and motor used to make test:
1/30/1967 - not tested
Length of time of test: ___ Hrs. ___ Min.
Drawdown: ___ ft. Artesian pressure: ft. above land surface ___ Give flow ___ cfs or ___ gpm. Shutoff pressure:
Controlled by: Valve [ ] Cap [ ] Plug [ ]
No control [ ] Does well leak around casing? Yes [ ] No [X]

31529

DEPTH FROM FEET	TO FEET	MATERIAL	WATER YES OR NO
0	10	Sandy topsoil	no
10	14	sand & corse gravel	no *
14	30	clay	no
30	80	sand & clay	no
80	85	wet sand	yes *
85	130	clay	no
130	185	sand & clay	no
185	192	Corse wet sand	yes *
192	207	Blueish clay & sand	nO
207	335	Corse sand & brown clay	no
335	365	Corse sand	yes
365	371	clay	no
371	377	sand	yes
377	382	clay	no
382	387	sand	yes
387	392	clay	no
392	450	Sand stone	yes
		* Note; Seasonal water	

Work started: October 1, 1966
Work finished: October 14, 1966
Well Driller's Statement: This well was drilled under my supervision and this report is true to the best of my knowledge.
Name: C. F. Baker
Address: Box 41, Middleton, Idaho
Signed by: C. F. Baker
License No. 175 Date: 9 Jan. 1967

Use other side for additional remarks

USGS

WATER RESOURCES
WESTERN REGION

Department of Water Resources

1. DRILLING PERMIT NO. 63- 93- W- 0619 - 000
Other IDWR No.

2. OWNER:
Name MARK LYNN
Address 6500 CHAPPARRAL
City EAGLE State ID Zip 83616

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N

T. 5N North ☒ or South ☐
R. 1W East ☐ or West ☒
Sec. 3 , 1/4 SE (10 acres) 1/4 (40 acres) NE (160 acres) 1/4
Gov't Lot County CANYON

S

Address of Well Site 6500 CHAPPARRAL, EAGLE, ID.
(Give at least Direction + Distance to Road or Landmark)

Lot No. Block No. Subd. Name

4. PROPOSED USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

5. TYPE OF WORK
☒ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

6. DRILL METHOD
☐ Mud Rotary ☒ Air Rotary ☒ Cable ☐ Other

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
BENT & CEMENT	200	170		POURED
CEMENT & BENT	170	150		PUMPED
BENT & CEMENT	150	140		POURED
SURFACE SEAL AROUND 12" TO				20'

Was drive shoe seal tested? Yes ☐ No ☒ How?

8. CASING/LINER:

Diameter	From	To	Guage	Casting	Liner	Steel	Plastic	Welded	Threaded
12	+1	79	250	X		☒	☐	☒	☐
8	+2	551	250	X		☒	☐	☒	☐
6	523	543				☐	☐	☐	☐
6	573	623				☐	☐	☐	☐

Final location of shoes 551
Top Packer or Headpipe 523 Bottom Tailpipe 623

9. PERFORATIONS/SCREENS
☐ Perforations Method
☒ Screens Type 304 Material STAINLESS

From	To	Slot Size	Number	Diameter	Tele/Pipe Size	Casting	Liner
543	563	.040		6	PIPE	☐	☒
563	573	.030		6	PIPE	☐	☒
						☐	☐
						☐	☐

10. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Depth	Time
NO TEST			

Temperature of water Was a water analysis done? Yes ☐ No ☐
By whom?
Water Quality (odor, etc.)
Bottom Hole Temperature

11. STATIC WATER LEVEL:
395 ft. below surface Depth artesian flow found
Artesian pressure lb. Describe access port
Describe Controlling Devices:

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	GP
14	0	5	TOP SOIL	
14	5	25	SAND & GRAVEL	
12	25	40	SANDY YELLOW CLAY	
12	40	60	SANDSTONE	
12	60	79	LOOSE SAND	
12	79	180	SANDSTONE	
12	180	235	COURSE SAND	
8	235	240	SANDSTONE	
8	240	250	SAND & PEA GRAVEL	
8	250	300	SANDSTONE	
8	300	320	SANDY BROWN CLAY	
8	320	340	SANDSTONE	
8	340	350	SANDY BROWN CLAY	
8	350	380	SANDSTONE	
8	380	385	SAND	
8	385	400	SANDSTONE	
8	400	410	SAND & GRAVEL	
8	410	440	SANDSTONE	
8	440	450	BROWN SAND	
8	450	480	SANDSTONE	
8	480	485	FINE SAND	
8	485	540	BLACK SANDSTONE	
8	540	550	COURSE SAND	
8	550	570	COURSE SAND & GRAVEL	
8	570	590	COURSE SAND	
8	590	600	COURSE BROWN SAND	
8	600	620	BROWN SAND	

Date: Started 7-10-93 Completed 10-18-93

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied the time the rig was removed.

Firm Name BILL DOTY DRILLING CO., INC. Firm No. 4
Firm Official Date 11-1-
and
Supervisor or Operato Date 11-1-
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

WELL DRILLER'S REPORT

Department of Water Resources

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1. WELL OWNER

Name MARK LYNN

Address 4931 SKYLINE DR EAGLE, ID 83616

Drilling Permit No. 63-93-W-0182

Water Right Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

3. PROPOSED USE

☒ Domestic ☐ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☒ Rotary ☐ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	8 inches	+ 1 feet	480 feet
.250 inches	6 inches	+2 feet	540 feet
_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☒ Yes ☐ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

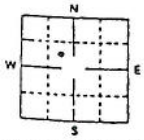
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☒ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet

Surface seal depth 40 Material used in seal: ☐ Cement grout ☒ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata

Describe access port _____

6. LOCATION OF WELL

Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County GEM
Address of Well Site _____ (give at least name of road)
SE ¼ NW ¼ Sec. 35, T. 6N N ☒ or S ☐, R. 1W E ☐ or W ☒

7. WATER LEVEL

Static water level 400 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature _____ °F. Quality _____
Describe artesian or temperature zones below.

8. WELL TEST DATA

☐ Pump ☐ Bailer ☒ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
40	500	2 HRS.

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
12	0	2	SANDY TOP SOIL		X
12	2	40	SAND & GRAVEL		X
8	40	280	DECOMPOSED GRANITE SAND		X
8	280	315	BROWN SANDSTONE		X
8	315	420	DECOMPOSED GRANITE SAND		X
8	420	426	BROKEN BROWN ROCK	X	
8	426	460	DECOMPOSED GRANITE SAND	X	
8	460	480	LIGHT COLORED SANDSTONE	X	
6	480	530	DECOMPOSED FINE GRANITE SAND	X	
6	530	560	HARD GRAY SANDSTONE	X	
6	560	580	COURSE LOOSE GRANITE SAND	X	

RECEIVED
JUN 23 1993
Department of Water Resources
Western Regional Office

10.

Work started 4-19-93 finished 6-5-93

11. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name BILL DOTY DRILLING CO., INC. Firm No. 42
Address 106 CALLOWAY CALDWELL, ID 83605 Date 6-17-93
Signed by Drilling Supervisor _____
and
(Operator) _____ (If different than the Drilling Supervisor)

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

1 of 2

1. WELL OWNER

Name Don B. Jensen

Address Rt. 1, Star, ID 83669

Owner's Permit No. _____

2. NATURE OF WORK

☒ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning) _____

3. PROPOSED USE

☐ Domestic ☒ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

4. METHOD DRILLED

☐ Rotary ☐ Air ☐ Hydraulic ☒ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

5. WELL CONSTRUCTION

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

Thickness	Diameter	From	To
.250 inches	16 inches	+ 2 feet	30 feet
.250 inches	16 inches	70 feet	110 feet
.250 inches	16 inches	150 feet	180 feet
.250 inches	16 inches	190 feet	220 feet

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches

Number	From	To
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet
_____ perforations	_____ feet	_____ feet

Well screen installed? ☒ Yes ☐ No
Manufacturer's name Roscoe Moss
Type _____ Model No. _____
Diameter 16 Slot size 80 Set from 110 feet to 150 feet
Diameter 16 Slot size 80 Set from 180 feet to 190 feet
Gravel packed? ☒ Yes ☐ No ☐ Size of gravel 3/8 minus
Placed from 20 feet to 370 feet
Surface seal depth 20' Material used in seal: ☐ Cement grout ☒ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port 2" pipe welded on side of casing

7. WATER LEVEL

Static water level _____ feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature ___ °F. Quality _____

8. WELL TEST DATA

☐ Pump ☐ Bailer ☐ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
28	0	11	Topsoil & Dirt		
	11	33	Brn. Clay w/some Sand		
	33	69	Sand Med. to Crse. w/some Pea Gravel		
	69	104	Brn. Clay w/some Sand		
	104	109	Sand Med. to Crse. w/some Clay		
	109	148	Sand Fine to Med.		
	148	161	Clay, Shale & some Sand		
	161	181	Sand & Clay mixed		
	181	190	Sand Med. to Crse.		
	190	201	Sand Fine to Med. w/Sandstone & Clay		
	201	204	Sand Med. to Crse.		
	204	217	Sand Fine to Med. s/some Clay		
	217	256	Sand Med. to Crse.		
	256	259	Sand Fine & some Sandstone		
	259	262	Sand Med. to Crse.		
	262	270	Blue & Brn. Clay w/some Sand		
	270	288	Sand Fine to Med. & Pea Gravel		
	288	317	Sand Med. to Crse. w/Pea Gravel		
	317	336	Sand Med. to Crse.		
	336	344	Blue Clay w/some Sand		
	344	354	Sand Crse.		
	354	370	Crse. Sand & Pea Gravel w/some Clay		

10.

Work started 2-1-80 finished 2-20-80

within 30 days after the completion or abandonment of the well.

WELL OWNER

Name Don B. Jensen

Address

Owner's Permit No.

NATURE OF WORK OK

☐ New well ☐ Deepened ☐ Replacement
☐ Abandoned (describe method of abandoning)

PROPOSED USE OK

☐ Domestic ☐ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other (specify type)

METHOD DRILLED OK

☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary
☐ Cable ☐ Dug ☐ Other

WELL CONSTRUCTION

Casing schedule: ☐ Steel ☐ Concrete ☐ Other

Thickness	Diameter	From	To
.250 inches	16 inches +	260 feet	290 feet
.250 inches	16 inches	330 feet	340 feet
.250 inches	16 inches	360 feet	366 feet
inches	inches	feet	feet

Was casing drive shoe used? ☐ Yes ☐ No
Was a packer or seal used? ☐ Yes ☐ No
Perforated? ☐ Yes ☐ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation inches by inches

Number	From	To
perforations	feet	feet
perforations	feet	feet
perforations	feet	feet

Well screen installed? ☐ Yes ☐ No
Manufacturer's name
Type Model No.
Diameter 16 Slot size 80 Set from 220 feet to 260 feet
Diameter 16 Slot size 80 Set from 290 feet to 330 feet
Diameter 16 Slot size 80 Set from 340 feet to 360 feet
Gravel packed? ☐ Yes ☐ No ☐ Size of gravel
Placed from feet to feet
Surface seal depth OK Material used in seal: ☐ Cement grout ☐ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☐ Overbore to seal depth
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent Weld ☐ Cemented between strata
Describe access port

7. WATER LEVEL

Static water level 17 feet below land surface.
Flowing? ☐ Yes ☒ No G.P.M. flow
Artesian closed-in pressure p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature °F. Quality

8. WELL TEST DATA

☒ Pump ☐ Bailer ☐ Air ☐ Other

Discharge G.P.M.	Pumping Level	Hours Pumped
700	278'	8 hrs.

9. LITHOLOGIC LOG

Hole Diam.	Depth From	Depth To	Material	Water Yes	Water No
			OK		

10.

Work started finished

LOCATION OF WELL

Sketch map location must agree with written location.

N / W / E / S — X

Subdivision Name

Lot No. Block No.

unty Gem

¼ NW ¼ Sec. 25 T. 6N N/S, R. 1W E/W.

11. DRILLERS CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name Pete Cope Drilling Co., Inc. Firm No. 213
Address P.O. Box 561 Meridian, ID 83642 Date 2-21-80
Signed by (Firm Official)
and
(Operator)

USE ADDITIONAL SHEETS IF NECESSARY — FORWARD THE WHITE COPY TO THE DEPARTMENT

Form 238-7
11/97

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0029062
DRILLING PERMIT NO. 782882
Other IDWR No. 63-31511

2. OWNER:
Name Donald B Jensen/Trellis Sub.
Address 8661 W Beacon Light RD
City ~~Boise~~ Star State ID Zip 83669

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location.

N / W / E / S

Twp. 5 North XX or South ☐
Rge. 1 East ☐ or West XX
Sec. 33, ____ 1/4 S/W 1/4 S/E 1/4 (10 acres / 40 acres / 160 acres)
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 1200' west, 600' northof intersection beacon Lt & Hwy 16 Star
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name unplatted

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other 48 lot subgolf pro shop

5. TYPE OF WORK check all that apply (Replacement etc.)
XX New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD
☐ Air Rotary ☐ Cable XX Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
bentonite grout	0	326	90 sk	pumped
#6-9 sand	318	364	1900#	poured

Was drive shoe used? ☐Y XX N Shoe Depth(s) ____
Was drive shoe seal tested? ☐ Y ☐ XX How? ____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
12"	+2	326'6"	375	steel	XX	☐	☒	☐
8	318	339	322	steel	☐	XX	☒	☐
8	359	364	322	steel	☐	XX	☒	☐

Length of Headpipe 21' Length of Tailpipe 5'

9. PERFORATIONS/SCREENS
Perforations Method ____
Screens Screen Type Johnson V wire

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
339	359	45		8	stnls	☐	XX
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
70 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: ____

11. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
950	100	170	2 Hour

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Wa Y
17	0	2	brown clay topsoil	
	2	11	tan sand	
	11	42	sand & ½" gravel	
	42	46	gravel & sand	
	46	48	brown clay & gravel	
	48	80	sand & gravel	X
	80	87	brown clay	
	87	106	gravel	X
	106	129	tan clay & gravel	
	129	138	blue clay	
	138	156	tan clay	
	156	175	blue clay	
	175	185	brown clay	
	185	193	sand	X
	193	217	blue clay	
	217	222	sand & gravel	X
	222	310	blue clay with sand streaks	X
12	310	339	brown clay & blue clay	
	339	359	coarse sand & gravel	X
8	359	373	tan clay	
	373	500	blue clay& fine sand streaks	X
			swedge packer 10" pipe 5' long	

RECEIVED
MAR 26 2003
WATER RESOURCES
WESTERN REGION

SCANNED
APR 01 2003

Completed Depth 364 (Measura
Date: Started 1/17/03 Completed 3/19/03

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Stevens & Sons Firm No. 15
Firm Official ____ Date 3/20/03
and
Driller or Operator ____ Date ____
(Sign once if Firm Official & Operator)

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
3/95-C96

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Inspected by _____
Twp _____ Rge _____ Sec _____
_____ 1/4 _____ 1/4 _____ 1/4
Lat: : : Long: : :

1. DRILLING PERMIT NO. 0 -0 -2 -9012 - _____
Other IDWR No. _____

2. OWNER:
Name Trae and Johnna Buchert
Address 5446 N. Emmett Hwy.
City Eagle State ID Zip 83616

3. LOCATION OF WELL by legal description:
Sketch map location must agree with written location

N
W E S

Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 28 1/4 (10 acres) SW 1/4 (40 acres) NE 1/4 (160 acres)
Gov't lot _____ County Ada
Lat: : : Long: : :
Address of Well Site 5446 N. Emmett Hwy
City Eagle
(Give at least name of road + Distance to Road or Landmark)
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

SEAL/FILTER PACK Material	From	To	AMOUNT Sacks or Pounds	METHOD
Bentonite	0	100	1000Lbs	Poured

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 448ft
Was drive shoe seal tested? ☐ Y ☐ N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
6"	+2	448	.250	Steel	☒	☐	☒	☐
5"	445	450	.258	Steel	☒	☐	☒	☐
					☐	☐	☐	☐

Length of Headpipe 5ft Length of Tailpipe —

9. PERFORATIONS/SCREENS
☐ Perforations Method _____
☒ Screens Screen Type johnson

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
450	460	.012	—	5"	SS	☐	☒
						☐	☐
						☐	☐

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
264ft. below ground Artesian Pressure _____ lb
Depth flow encountered _____ ft. Describe access port or control devices: _____

11. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min.	Drawdown	Pumping Level	Time
75GPM	—	458	2hours

Water Temp. 60DegF Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encountered 264ft

12. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia	From	To	Remarks: Lithology, Water Quality & Temp.	Water Y	Water N
10"	0	2	Top Soil		X
"	2	20	Sandy Clay		X
8"	20	26	Sandy Clay		X
"	26	63	Coarse Sand		X
"	63	156	Tan Clay with Sand Strips		X
"	156	170	Coarse Sand		X
"	170	243	Sandy Clay		X
"	243	280	Coarse Sand	X	
"	280	328	Tan Clay		X
"	328	360	Blue Clay		X
"	360	370	Coarse Sand	X	
6"	370	410	Blue Clay		X
"	410	418	Sand	X	
"	418	426	Blue Clay		X
"	426	430	Fine Gray Sand	X	
"	430	448	Blue Clay		X
"	448	460	Gray Sand	X	

RECEIVED
JAN 09 2003
WATER RESOURCES
WESTERN REGION

Completed Depth: _____ (Measurable)
Date: Started 12-18-02 Completed 12-30-02

13. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Firm Name COONSE WELL DRILLING Firm No. 409
Firm Official [signature] Date 1-3-03
Supervisor or Operator [signature] Date 1-3-03
(Sign once if Firm Official & Operator)

Date: 1/3/03 Time: 9:03 AM

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Inspected by _____
Twp _____ Rge _____ Sec _____
_____ 1/4 _____ 1/4 _____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0031062
DRILLING PERMIT NO. _____
Water Right or Injection Well No. _____

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr Suite # 300
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 23 1/4 NE 1/4 (10 acres) SW 1/4 (160 acres)
Gov't Lot _____ County Ada
Lat: : : Long: :
Address of Well Site Big Gulch SW of Willow Creek Rd City Eagle
(Give nearest named roads + Distance to Road or Landmark)
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other Test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable ☒ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
30% Grout	815	380	—	Pressure Grout
30% Grout	240	0	—	Pressure Grout

Was drive shoe used? ☐Y ☐N Shoe Depth(s)
Was drive shoe seal tested? ☐Y ☐N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	278	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____
Packer ☐Y ☐N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method Perf. 8" Casing 10 FT
Screen Type & Method of Installation Shutter Screen 60 FT

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
280	340	1/8	Many	8"	Steel	☐	☐
340	350	1/8	60	8"	Steel	☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
5/16 Pea Gravel	380	242	—	Pour

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
161 ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____
Well cap

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
100 - 200			1 hour

Water Temp. 72° Bottom hole temp. _____
Water Quality test or comments: From .5 PH 7.5 Grains 5
Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	3	top soil & clay		
"	3	30	coarse sand		
"	30	55	brown clay		
"	55	60	sand		
"	60	70	brown clay		
"	70	120	soft & hard clay layers		
"	120	130	sand & clay		
"	130	135	coarse sand		
"	135	150	clay		
"	150	190	clay w/some sand layers		
"	190	200	sand		
"	200	210	clay w/sand		
"	210	280	coarse sand w/little clay		
"	280	290	coarse sand		
"	290	340	coarse sand		
"	340	350	bluish coarse sand w/some wood		
"	350	380	coarse blue sand		
"	380	440	coarse blue sand		
"	440	470	blue clay		
"	470	815	blue clay		

RECEIVED
APR 19 2004
WATER RESOURCES
WESTERN REGION

Completed Depth 350' (Measurable)
Date: Started 3/10/04 Completed 4-10-04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Adamson Pump & Drill Firm No. 45
Principal Driller Dave Adamson Date 4.15.04
and
Driller or Operator II Dave Adamson Date 4.15.04
Operator I _____ Date _____
Principal Driller and Rig Operator *Required*.
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Well ID No. ____ Inspected by ____ Twp ____ Rge ____ Sec ____ ____ 1/4 ____ 1/4 ____ 1/4 Lat: : : Long: : :

1. WELL TAG NO. D 0030892
DRILLING PERMIT NO. ____
Water Right or Injection Well No. ____

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 , ____ 1/4 SE 1/4 NW 1/4
Gov't Lot ____ County Ada
Lat: : : Long: : :
Address of Well Site 1 mile SW of Willow Creek Rd Big Gulch City Eagle
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk: ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
Bentonite	0	105	3150#	over bore

Was drive shoe used? ☒Y ☐N Shoe Depth(s) 738'
Was drive shoe seal tested? ☐Y ☒N How? ____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8'	+2	738'	250	Steel	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe ____ Length of Tailpipe ____
Packer ☐Y ☐N Type ____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 PERFS
Screen Type & Method of Installation NONE PER ROW

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
560	580	1/4	360	8"	.250 WALL	☒	☐
580	600	1/4	360	8"	CASING	☒	☐
600	620	1/4	360	8"	"	☒	☐
620	640	1/4	360	8"	"	X	

Filter Material	From	To	Weight / Volume	Placement Method
Continued on page 2				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
455 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: Steel plate

12. WELL TESTS:
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
175			6 hours

Water Temp. 80° Bottom hole temp. ____
Water Quality test or comments: Iron .5 PH 7.5 Grams 2 Depth first Water Encounter 59[illegible]

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	0	10	sandy soil		
"	10	96	tan clay		
"	96	105	blue clay		
8	105	134	blue clay		
"	134	140	tan clay		
"	140	195	pea gravel & clay		
"	195	360	Lt gray sand & clay		
"	360	367	coarse sand & clay like pea gravel		
"	367	505	Fine & coarse sand		
"	505	540	larger pea gravel		
"	540	590	pea gravel w/ large sand quartz		
"	590	595	quartz sand	X	
"	595	605	Finer tan sand		
"	605	620	quartz sand	X	
"	620	640	Finer sand	X	
"	640	645	quartz sand	X	
"	645	655	quartz sand & some pea gravel	X	
"	655	660	gravel & quartz sand	X	
"	660	670	big sand		
"	670	680	big sand	X	
"	680	685	big sand		
"	685	690	big sand	X	
"	690	730	big sand	X	
"	730	740	big sand	X	

Due to heaving sand - a mixture of sand & cement was placed from 730' to 74[illegible]

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WATER RESOURCES
WESTERN REGION

Completed Depth 730' (Measurable)
Date: Started 01-26-04 Completed 02-27-04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Company Name Adamson Pump & Drilling Firm No. 45[illegible]
Principal Driller Dave Adamson Date 3-15-04
and
Driller or Operator II Dave Adamson Date 3-15-04
Operator I ____ Date ____
Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES

WELL DRILLER'S REPORT

Well ID No. _____
Inspected by _____
Twp _____ Rge _____ Sec _____
_____ 1/4 _____ 1/4 _____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 0030892 pg 2
DRILLING PERMIT NO. _____
Water Right or Injection Well No. _____

2. OWNER:
Name Spring Valley Development LLC
Address 485 E. Riverside Dr
City Eagle State Id Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 5 North ☒ or South ☐
Rge. 1 East ☐ or West ☒
Sec. 13 _____ 1/4 SE 1/4 NW 1/4
Gov't Lot _____ County Ada
Lat: : : Long: :
Address of Well Site 1 mile SW of Willow Creek Rd
Big Gulch City Eagle
Lt. _____ Blk. _____ Sub. Name _____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☒ Other test

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other _____

6. DRILL METHOD:
☒ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method

Was drive shoe used? ☐Y ☐N Shoe Depth(s) _____
Was drive shoe seal tested? ☐Y ☐N How? _____

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐

Length of Headpipe _____ Length of Tailpipe _____
Packer ☐Y ☐N Type _____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method STAR PERF. 4 ROWS @ JOINT 90 DEGS
Screen Type & Method of Installation PER ROW (360)

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
640	660	1/4	360	8"	.250 WALL	☒	☐
660	680	1/4	360	8"	CASING	☒	☐
680	700	1/4	360	8"	"	☒	☐
700	720	1/4	360	8"	"	X	

Filter Material	From	To	Weight / Volume	Placement Method
720 - 730				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
_____ ft. below ground Artesian pressure _____ lb.
Depth flow encountered _____ ft. Describe access port or control devices: _____

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encounter _____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N

Completed Depth _____ (Measurable)
Date: Started _____ Completed _____

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Adamson Pump & Drilling Firm No. 457
Principal Driller Dave Adamson Date 3-15-04
and
Driller or Operator II Dave Adamson Date 3-15-04
Operator I _____ Date _____

Principal Driller and Rig Operator *Required.*
Operator I must have signature of Driller/Operator II.

FORWARD WHITE COPY TO WATER RESOURCES

Form 238-7
6/02

IDAHO DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

Office Use Only
Well ID No. 815597
Inspected by
Twp ____ Rge ____ Sec ____
____ 1/4 ____ 1/4 ____ 1/4
Lat: : : Long: : :

1. WELL TAG NO. D 00031493
DRILLING PERMIT NO. 815597
Water Right or Injection Well No.

2. OWNER:
Name SIMCOR
Address 485 EAST RIVERSIDE DR SUITE 300
City EAGLE ID State ID Zip 83616

3. LOCATION OF WELL by legal description:
You must provide address or Lot, Blk, Sub. or Directions to well.
Twp. 05 North ☒ or South ☐
Rge. 01 East ☒ or West ☐
Sec. 8, SW 1/4 (10 acres) SW 1/4 (40 acres) ____ 1/4 (160 acres)
Gov't Lot ____ County ADA
Lat: : : Long: : :
Address of Well Site 1/2 MILE NE OF WILLOW CREEK RD City EAGLE
(Give at least name of road + Distance to Road or Landmark)
Lt. ____ Blk. ____ Sub. Name ____

4. USE:
☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other TEST WELL

5. TYPE OF WORK check all that apply (Replacement etc.)
☒ New Well ☐ Modify ☐ Abandonment ☐ Other ____

6. DRILL METHOD:
☐ Air Rotary ☐ Cable ☒ Mud Rotary ☐ Other ____

7. SEALING PROCEDURES

Seal Material	From	To	Weight / Volume	Seal Placement Method
30% B. GROUT	1	500	4000 LB	PRESSURE GROUTED
30% B. GROUT	1000	770	1470 LB	PRESSURE GROUTED

Was drive shoe used? ☒Y ☐N Shoe Depth(s) ____
Was drive shoe seal tested? ☐Y ☒N How? ____
GRAVEL 3/8 FROM 770 TO 1666

8. CASING/LINER:

Diameter	From	To	Gauge	Material	Casing	Liner	Welded	Threaded
8"	+2	600	.250	STEEL	☒	☐	☐	☐
6"	630	600	.250	STEEL	☐	☒	☒	☐
					☐	☐	☐	☐

Length of Headpipe 25 FT Length of Tailpipe 0
Packer ☒Y ☐N Type ____

9. PERFORATIONS/SCREENS PACKER TYPE
Perforation Method ____
Screen Type & Method of Installation STAINLESS STEEL

From	To	Slot Size	Number	Diameter	Material	Casing	Liner
640	680	.40	—	6"	STAINLESS	☐	☐
600	580	.30	—	6"	STAINLESS	☐	☐
						☐	☐

10. FILTER PACK

Filter Material	From	To	Weight / Volume	Placement Method
NONE				

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:
485 ft. below ground Artesian pressure ____ lb.
Depth flow encountered ____ ft. Describe access port or control devices: ____
Well Cap

12. WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal./min.	Drawdown	Pumping Level	Time
AIR 50 GPM	—	—	—

Water Temp. ____ Bottom hole temp. ____
Water Quality test or comments: ____
Depth first Water Encounter ____

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

Bore Dia.	From	To	Remarks: Lithology, Water Quality & Temperature	Water Y	Water N
12	1	15	TOP SOIL & SAND		
	15	35	SANDY CLAY		
	35	360	COARSE SAND		
	360	380	COARSE SAND & CLAY		
	380	480	COARSE SAND & CLAY MIX		
	480	490	COARSE SAND & CLAY MIX		
	490	505	TAN CLAY		
	505	520	SAND & CLAY MIX		
	520	530	SAND		
	530	560	SAND & CLAY		
	560	590	MORE SAND LESS CLAY COARSE		
	590	620	CLAY TAN & WHITE		
	620	632	CLAY W/ SAND STREAKS		
	632	640	SHORT SAND STREAKS IN CLAY		
	640	660	TAN CLAY		
	660	670	TAN CLAY		
	670	680	SOFT WHITISH CLAY		
	680	687	WHITISH CLAY & BLUE CLAY - SAND		
	687	690	HARD CLAY BLUISH		
	690	715	BLUE CLAY - COARSE SAND		
	715	740	BLUE CLAY HARD & SOFT		
	740	760	BLUE CLAY		
	760	800	BLUE CLAY		
	800	825	BLUE CLAY SHORT SOFT SPOTS		
	825	835	BLUE CLAY		
	835	860	BLUE & WHITE CLAY		
	860	880	BLUE CLAY W/ COARSE SAND		
	880	920	SOFT BLUE CLAY		
	920	940	BLUE CLAY		
	940	980	BLUE CLAY		
	980	1005	BLUE CLAY		

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Completed Depth 770' (Measurable)
Date: Started 6-7-04 Completed 7-29-04

14. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name ADAMSON PUMP & DRILLING Firm No. 457
Principal Driller Dave Adamson Date 7-30-04
and
Driller or Operator II Dave Adamson Date 7-30-04
Operator I ____ Date ____
Principal Driller and Rig Operator *Required*.
Operator I must have signature of Driller/Operator II.

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SECOND SVR-10 WELL

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources within 30 days after the completion or abandonment of the well.

WELL OWNER
Name Bob Harmon
Address Po Box 7727 Boise
Drilling Permit No. 63-93-W-6703
Water Right Permit No. _____

NATURE OF WORK
☑ New well ☐ Deepened ☐ Replacement
☐ Well diameter increase ☐ Modification
☐ Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)

PROPOSED USE
☑ Domestic ☐ Irrigation ☐ Monitor
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

METHOD DRILLED
☑ Rotary ☑ Air ☐ Auger ☐ Reverse rotary
☐ Cable ☐ Mud ☐ Other _____ (backhoe, hydraulic, etc.)

WELL CONSTRUCTION
Casing schedule: ☑ Steel ☐ Concrete ☐ Other _____

	Thickness	Diameter	From	To
r	.250 inches	10 inches	+ 1 feet	28 feet
-	.250 inches	6 inches	+ 2 feet	34 feet
	_____ inches	_____ inches	_____ feet	_____ feet

Was casing drive shoe used? ☑ Yes ☐ No
Was a packer or seal used? ☐ Yes ☐ No
Perforated? NO ☐ Yes ☐ No
How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun
Size of perforation? _____ inches by _____ inches

Number		From	To
_____	perforations	_____ feet	_____ feet
_____	perforations	_____ feet	_____ feet
_____	perforations	_____ feet	_____ feet

Well screen installed? ☐ Yes ☒ No
Manufacturer _____ Type _____
Top Packer or Headpipe _____
Bottom of Tailpipe _____

Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Diameter ____ Slot size ____ Set from ____ feet to ____ feet
Gravel packed? ☐ Yes ☐ No ☐ Size of gravel _____
Placed from _____ feet to _____ feet

Surface seal depth 25 Material used in seal: ☑ Cement grout ☐ Bentonite ☐ Puddling clay ☐ _____
Sealing procedure used: ☐ Slurry pit ☑ Overbore to seal depth ☐ Temp. surface casing
Method of joining casing: ☐ Threaded ☐ Welded ☐ Solvent Weld ☐ Cemented between strata

Describe access port Sani Seal

7. WATER LEVEL
Static water level 6 feet below land surface.
Flowing? ☐ Yes ☐ No G.P.M. flow _____
Artesian closed-in pressure _____ p.s.i.
Controlled by: ☐ Valve ☐ Cap ☐ Plug
Temperature 54 °F. Quality good
Describe artesian or temperature zones below.

8. WELL TEST DATA
☐ Pump ☐ Bailer ☑ Air ☐ Other _____

Discharge G.P.M.	Pumping Level	Hours Pumped
190	180	4

9. LITHOLOGIC LOG

Bore Diam.	Depth From	Depth To	Material	Water Yes	Water No
14	0	25	Brown Clay		X
8	25	50	Brown Clay		X
8	50	65	Granite Soft		X
8	65	75	Granite Soft		X
8	75	100	Red + White Clay		X
8	100	105	White Clay		X
8	105	220	Basalt + Frac	X	
8	220	250	Granite		X
			Water RS-153		
			25-22		

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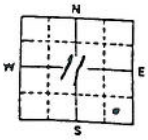
WATER RESOURCES
WESTERN REGION

10.
Work started 8-15-93 finished 9-7-93

LOCATION OF WELL
Sketch map location must agree with written location.



Subdivision Name _____
Lot No. _____ Block No. _____
County _____
Address of Well Site 5 mi northeast Emmett (give at least name of road)
SE ¼ SE ¼ Sec. 11, T. 5 ☐ N ☒ or S ☐, R. 1 ☐ E ☒ or W ☐

11. DRILLER'S CERTIFICATION
I/We certify that all minimum well construction standards were complied with at the time the rig was removed.
Firm Name Frank Shelby Firm No. 326
Address 960 N W 14TH Payette Date _____
Signed by Drilling Supervisor Frank Shelby
and
(Operator) _____ *(if different than the Drilling Supervisor)*

Appendix F
Additional Water Chemistry Data

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0418190

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: T SCANLAN
Submitted By: T SCANLAN

Source of Sample:
WADE LYNN WELL

Time of Collection: 14:15
Date of Collection: 6/7/2004
Date Received: 6/7/2004
Report Date: 6/21/2004

PWS:

FIELD TEMP=30.5 C FIELD EC = 278 US FIELD SC = 254 US

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		<0.005	mg/L	0.005	SM 3113 B	6/19/2004	DMB
Calcium, Ca		17.2	mg/L	0.10	EPA 200.7	6/11/2004	JH
Iron, Fe		0.08	mg/L	0.05	EPA 200.7	6/11/2004	JH
Magnesium, Mg		2.84	mg/L	0.10	EPA 200.7	6/11/2004	JH
Manganese, Mn		0.19	mg/L	0.05	EPA 200.7	6/11/2004	JH
Potassium, K		2.0	mg/L	0.5	EPA 200.7	6/11/2004	JH
Silica		37.4	mg/L	0.25	EPA 200.7	6/14/2004	JH
Sodium, Na		30.3	mg/L	0.10	EPA 200.7	6/11/2004	JH
Nitrate (as N)		<0.2	mg/L	0.2	EPA 300.0	6/8/2004	WW
Ammonia Direct (as N)		0.58	mg/L	0.04	EPA 350.1	6/11/2004	WW
Bicarbonate		124	mg/L		SM 2320	6/11/2004	ARR
Chloride, Cl		3	mg/L	1	EPA 300.0	6/11/2004	WW
Fluoride, F		0.30	mg/L	0.10	EPA 300.0	6/10/2004	WW
Hardness		55.4	mg/L	5.0	SM 2340	6/11/2004	ARR
pH		7.3	S.U.		EPA 150.1	6/8/2004	ARR
Sulfate, SO4		1	mg/L	1	EPA 300.0	6/11/2004	WW
Total Dissolved Solids		154	mg/L	25	EPA 160.1	6/10/2004	DLR

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

Analytical Lab atories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0418188

Attn: TERRY SCANLAN, P.E.,P.G.
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: T SCANLAN
Submitted By: T SCANLAN

Source of Sample:
CORBETT LYNN WELL

Time of Collection: 12:20
Date of Collection: 6/7/2004
Date Received: 6/7/2004
Report Date: 6/21/2004

PWS:

FIELD TEMP=29.8 C FIELD EC = 270 US FIELD SC = 248 US

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		0.027	mg/L	0.005	SM 3113 B	6/19/2004	DMB
Calcium, Ca		20.9	mg/L	0.10	EPA 200.7	6/11/2004	JH
Iron, Fe		0.05	mg/L	0.05	EPA 200.7	6/11/2004	JH
Magnesium, Mg		0.24	mg/L	0.10	EPA 200.7	6/11/2004	JH
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	6/11/2004	JH
Potassium, K		1.3	mg/L	0.5	EPA 200.7	6/11/2004	JH
Silica		40.3	mg/L	0.25	EPA 200.7	6/14/2004	JH
Sodium, Na		27.8	mg/L	0.10	EPA 200.7	6/11/2004	JH
Nitrate (as N)		<0.2	mg/L	0.2	EPA 300.0	6/8/2004	WW
Ammonia Direct (as N)		0.05	mg/L	0.04	EPA 350.1	6/11/2004	WW
Bicarbonate		77.2	mg/L		SM 2320	6/11/2004	ARR
Chloride, Cl		4	mg/L	1	EPA 300.0	6/11/2004	WW
Fluoride, F		1.71	mg/L	0.10	EPA 300.0	6/10/2004	WW
Hardness		54.4	mg/L	5.0	SM 2340	6/11/2004	ARR
pH		7.6	S.U.		EPA 150.1	6/8/2004	ARR
Sulfate, SO4		29	mg/L	1	EPA 300.0	6/11/2004	WW
Total Dissolved Solids		120	mg/L	25	EPA 160.1	6/10/2004	DLR

Michael D. Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

Analytical Laboratories, Inc.
1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

Laboratory Analysis Report

Sample Number: 0418189

Attn: TERRY SCANLAN, P.E.,
S P F WATER ENGINEERING, LLC
600 E RIVER PARK LN STE 105
BOISE, ID 83706

Collected By: T SCANLAN
Submitted By: T SCANLAN

Source of Sample:
LYNN OLD IRRIGATION WELL

Time of Collection: 12:50
Date of Collection: 6/7/2004
Date Received: 6/7/2004
Report Date: 6/21/2004

PWS:

FIELD TEMP=27.9 C FIELD EC = 296 US FIELD SC = 280 US

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Arsenic Furnace		0.014	mg/L	0.005	SM 3113 B	6/19/2004	DMB
Calcium, Ca		17.1	mg/L	0.10	EPA 200.7	6/11/2004	JH
Iron, Fe		<0.05	mg/L	0.05	EPA 200.7	6/11/2004	JH
Magnesium, Mg		0.45	mg/L	0.10	EPA 200.7	6/11/2004	JH
Manganese, Mn		<0.05	mg/L	0.05	EPA 200.7	6/11/2004	JH
Potassium, K		1.0	mg/L	0.5	EPA 200.7	6/11/2004	JH
Silica		36.4	mg/L	0.25	EPA 200.7	6/14/2004	JH
Sodium, Na		40.9	mg/L	0.10	EPA 200.7	6/11/2004	JH
Nitrate (as N)		1.3	mg/L	0.2	EPA 300.0	6/8/2004	WW
Ammonia Direct (as N)		<0.04	mg/L	0.04	EPA 350.1	6/11/2004	WW
Bicarbonate		94.1	mg/L		SM 2320	6/11/2004	ARR
Chloride, Cl		6	mg/L	1	EPA 300.0	6/11/2004	WW
Fluoride, F MCL exceeded.		4.09	mg/L	0.10	EPA 300.0	6/10/2004	WW
Hardness		45.6	mg/L	5.0	SM 2340	6/11/2004	ARR
pH		7.9	S.U.		EPA 150.1	6/8/2004	ARR
Sulfate, SO4		19	mg/L	1	EPA 300.0	6/11/2004	WW
Total Dissolved Solids		154	mg/L	25	EPA 160.1	6/10/2004	DLR

Michael D. Moore

Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact: Michael Moore

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

ANALYTICAL LABORATORIES, INC.
1804 N. 33rd Street
Boise, Idaho 83703
Phone # (208) 342-5515

LABORATORY ANALYSIS REPORT
SAMPLE NUMBER - 6548

Attn. TERRY SCANLAN

SCANLAN ENGINEERING
600 EAST RIVER PARK LANE
SUITE 105
BOISE, ID 83706

Time of Collection: 11:00
Date of Collection: 02/14/03

Date Received: 02/14/03
Date Reported: 02/26/03

Collected by: C FEAST

Submitted by: C FEAST

Source of Sample: PROJECT NAME:SPRING VALLEY RANCH BIG GULCH 1

Test Requested	FRDS #	MCL	Analysis Result	Unit	MDL	Method	Date Completed	Analyst Initials
ANTIMONY FURNACE			<0.005	mg/L	0.005	EPA 200.9	02/24/03	DMB
ARSENIC FURNACE			0.005	mg/L	0.003	EPA 200.9	02/21/03	DMB
BARIUM			0.05	mg/L	0.05	EPA 200.7	02/18/03	JH
BERYLLIUM FURNACE			<0.0005	mg/L	0.0005	EPA 200.9	02/18/03	DMB
CALCIUM			30.8	mg/L	0.10	EPA 200.7	02/19/03	JH
CHROMIUM FURNACE			<0.002	mg/L	0.002	EPA 200.9	02/26/03	DMB
IRON			<0.05	mg/L	0.05	EPA 200.7	02/21/03	JH
MAGNESIUM			6.65	mg/L	0.10	EPA 200.7	02/19/03	JH
MANGANESE			<0.05	mg/L	0.05	EPA 200.7	02/21/03	JH
MERCURY			<0.0002	mg/L	0.0002	EPA 245.1	02/20/03	KLZ
NICKEL			<0.02	mg/L	0.02	EPA 200.7	02/19/03	JH
POTASSIUM			2.1	mg/L	0.5	EPA 200.7	02/19/03	JH
SODIUM			19.2	mg/L	0.10	EPA 200.7	02/19/03	JH
THALLIUM FURNACE			<0.002	mg/L	0.002	EPA 200.9	02/18/03	DMB
AMMONIA DIRECT			<0.04	mg/L	0.04	EPA 350.1	02/18/03	GMM
NITRATE N			0.30	mg/L	0.20	EPA 300.0	02/14/03	GMM
NITRITE N			<0.01	mg/L	0.01	SM 4500NO2-B	02/14/03	CSC
SULFIDE			<0.05	mg/L	0.05	SM 4500 D	02/17/03	JR
BICARBONATE			121	mg/L		SM 2320	02/20/03	GMM
CHLORIDE			5	mg/L	1	EPA 300.0	02/18/03	GMM
FLUORIDE DIRECT			0.60	mg/L	0.10	EPA 300.0	02/21/03	GMM
HARDNESS			107	mg/L	5.0	SM 2340	02/20/03	GMM
SULFATE			24	mg/L	1.0	EPA 300.0	02/18/03	GMM
TOTAL DISSOLVED SOLIDS			206	mg/L	25	EPA 160.1	02/18/03	RG

Michael D. Moore

THANK YOU FOR CHOOSING ANALYTICAL LABORATORIES, INC. FOR YOUR TESTING NEEDS.

PLEASE CONTACT MICHAEL MOORE IF YOU HAVE ANY QUESTIONS REGARDING THIS REPORT OR ANY FUTURE ANALYTICAL NEEDS.

ANALYTICAL LABORATORIES, INC.
1804 N. 33rd Street
Boise, Idaho 83703
Phone # (208) 342-5515

LABORATORY ANALYSIS REPORT
SAMPLE NUMBER - 6549

Attn. TERRY SCANLAN

SCANLAN ENGINEERING
600 EAST RIVER PARK LANE
SUITE 105
BOISE, ID 83706

Time of Collection: 12:00
Date of Collection: 02/14/03

Date Received: 02/14/03
Date Reported: 02/26/03

Collected by: C FEAST

Submitted by: C FEAST

Source of Sample: PROJECT NAME:SPRING VALLEY RANCH LITTLE GULCH 1

Test Requested	FRDS #	MCL	Analysis Result	Unit	MDL	Method	Date Completed	Analyst Initials
ANTIMONY FURNACE			<0.005	mg/L	0.005	EPA 200.9	02/24/03	DMB
ARSENIC FURNACE			0.006	mg/L	0.003	EPA 200.9	02/21/03	DMB
BARIUM			<0.05	mg/L	0.05	EPA 200.7	02/18/03	JH
BERYLLIUM FURNACE			<0.0005	mg/L	0.0005	EPA 200.9	02/18/03	DMB
CALCIUM			23.9	mg/L	0.10	EPA 200.7	02/19/03	JH
CHROMIUM FURNACE			0.004	mg/L	0.002	EPA 200.9	02/26/03	DMB
IRON			<0.05	mg/L	0.05	EPA 200.7	02/21/03	JH
MAGNESIUM			6.55	mg/L	0.10	EPA 200.7	02/19/03	JH
MANGANESE			<0.05	mg/L	0.05	EPA 200.7	02/21/03	JH
MERCURY			<0.0002	mg/L	0.0002	EPA 245.1	02/20/03	KLZ
NICKEL			<0.02	mg/L	0.02	EPA 200.7	02/19/03	JH
POTASSIUM			1.7	mg/L	0.5	EPA 200.7	02/19/03	JH
SODIUM			21.2	mg/L	0.10	EPA 200.7	02/19/03	JH
THALLIUM FURNACE			<0.002	mg/L	0.002	EPA 200.9	02/18/03	DMB
AMMONIA DIRECT			<0.04	mg/L	0.04	EPA 350.1	02/18/03	GMM
NITRATE N			0.59	mg/L	0.20	EPA 300.0	02/14/03	GMM
NITRITE N			<0.01	mg/L	0.01	SM 4500NO2-B	02/14/03	CSC
SULFIDE			<0.05	mg/L	0.05	SM 4500 D	02/17/03	JR
BICARBONATE			104	mg/L		SM 2320	02/20/03	GMM
CHLORIDE			6	mg/L	1	EPA 300.0	02/18/03	GMM
FLUORIDE DIRECT			0.59	mg/L	0.10	EPA 300.0	02/21/03	GMM
HARDNESS			89.7	mg/L	5.0	SM 2340	02/20/03	GMM
SULFATE			21	mg/L	1.0	EPA 300.0	02/18/03	GMM
TOTAL DISSOLVED SOLIDS			192	mg/L	25	EPA 160.1	02/18/03	RG

Michael D. Moore

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